PRELIMINARY INFRASTRUCTURE PLANNING

Mitchell Field Marine Business District Harpswell, Maine

Prepared for:

TOWN OF HARPSWELL

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INTRODUCTION

This Preliminary Infrastructure Plan Report for the Mitchell Field Marine Business District has been prepared by DeLuca-Hoffman Associates, Inc. (DHAI) for the Town of Harpswell in accordance with DHAI's proposal dated November 14, 2011. The goal of this report is to present information related to existing conditions and potential future infrastructure needs related to the development of the Mitchell Field Marine Business District (MFMBD).

The report was based on the assumption that 75 employees, visitors, and guests will occupy the MFMBD each day. All land lease contemplated will be located within the MFMBD. Certain infrastructure components may be located outside its boundaries and used in common with others.

The project team consisted of the following consultants:

- **DeLuca-Hoffman Associates, Inc., South Portland, Maine**

  DeLuca-Hoffman Associates, Inc. (DHAI) led the project team in developing this report. While DHAI contributed to each section within this report, our work primarily focused on site and utility infrastructure, including analysis of the existing roadway network within Mitchell Field, water and wastewater services, topography, and stormwater management. The analysis was focused on how these components could serve potential uses within the Mitchell Field Business District (MFMBD).

- **Sanborn, Head & Associates, Inc., Portland, Maine**

  Work by Sanborn Head & Associates, Inc., (Sanborn Head) was primarily focused on hydrogeologic issues related to feasibility of on-site groundwater supply, subsurface disposal of sanitary wastewaters, and a preliminary assessment of potential geotechnical considerations for siting of structures. Sanborn Head also provided input regarding possible considerations for development of the site posed by environmental Deed Restrictions and other conditions established for the site by the Maine Department of Environmental Protection (MeDEP) and Department of Health and Human Services (DHHS).

- **Utility Service Co., Inc., Center Barnstead, New Hampshire**

  Utility Service Co., Inc. (Utility Service Co.) conducted a visual inspection on the 100,000 gallon elevated water storage tank in order to determine the condition of the coatings and structure and to evaluate the tank for compliance with sanitation guidelines, safety & security regulations and guidelines in accordance with AWWA, OSHA and MEDEP Guidelines.

- **TEC Associates, Inc., South Portland, Maine**

  TEC Associates, Inc. conducted an inspection of the former Navy fuel depot pier in order to make a preliminary assessment of the pier's condition and determine what areas may require additional study.

The report benefited by the following reconnaissance:

- **September 29, 2011** - DHAI visited the Town Offices to review the available project files for the site. During about a 3-hour visit, DHAI reviewed the archive documentation available within the Planning Office, with specific emphasis on the relevant information pertaining to utilities and infrastructure. A brief meeting with Carol Tukey, Town Planner, was also held to discuss the content of the materials.

- **December 6, 2011** – Site visit by DHAI to assess the existing roadway conditions accessing the Mitchell Field Marine Business District as well as locate the physical appurtenance structures installed as part of the underground primary electrical and communications conduits.

- **December 16, 2011** – DHAI visited the Town Offices to perform a detailed review of the archive plans available for the site. Specific emphasis was placed on obtaining copies of the specific plans pertinent to the site and infrastructure improvements relevant to our work.

- **December 21, 2011** – Sanborn Head visited the offices of MeDEP to review the available project files for the site. During about an 8-hour visit, Sanborn Head reviewed the large volume of available documentation focused on specific information believed relevant to the primary focus of our charge outlined above. Brief discussions were also held with Ms. Gail E. Lipfert, the MeDEP Project Geologist, and Mr. Naji N. Akladdiss, P.E., the Remedial Program Project Manager.

- **December 22, 2011** – Site visit by Utility Services Co. to perform a visual inspection of the 100,000 gallon elevated water storage tank.

- **December 30, 2011** – Site visit by Sanborn Head to conduct a general reconnaissance of the site and vicinity to observe the locations within the MFMBD area where development is likely to occur, the conditions near supply well NWSW and possible areas for development of subsurface wastewater disposal and possible additional/alternate water supply wells.

- **January 11, 2012** – Site visit by DHAI to perform general site reconnaissance and assess the accuracy of published survey data, to the extent possible.

- **January 19, 2012** – Site visit by TEC Associates to make a preliminary assessment of the former Navy fuel depot pier's condition and determine what areas may require additional study.

The following plans and documents were reviewed for information related to the site, and were used throughout this report:

1. Quitclaim Deed for the former Navy Fuel Depot site (Mitchell Field), dated October 22, 2001.

2. Quitclaim Deed for the former Navy Family Housing parcel associated with Mitchell Field, dated September 14, 2005.

3. Letter from Naji Akladiss, P.E. to Ms. Kristi Eiane, dated September 15, 2008 regarding NWSW.

4. Initial new source water well application and findings of testing of a new water supply well, designated NWSW that was installed by the Defense Logistics Agency (DLA) in 1998 prior to transfer of the site.

5. Letter from Wilkes B. Harper, MeDEP Superfund / Federal Facilities Unit to Mr. Chris Heinig, Harpswell Neck Fire Department, Inc. regarding potential acquisition of a 2 acre portion of the Mitchell Field site.

6. Letter from Nicholas J. Hodgkins, MeDEP VRAP program to Ms. Carol Tukey, Town of Harpswell Planner regarding VRAP program

7. Town of Harpswell Shoreland Zoning Ordinance, updated June 14, 2011

8. The Mitchell Field Master Plan, September 13, 2007

9. Standard Boundary Survey, Casco Bay Fuel Farm Route 123, Harpswell, Maine; for the Town of Harpswell; by Harty and Harty Professional Land Surveyors, Dated 8/20/01

10. AVGAS & Jet Fuel Storage Facilities Sub-Surface Plans by Thomas Worchester Inc. – Arch. & Engr. For Department of the Navy, Dated 7/7/52

11. GIS data obtained from the Maine Office of GIS (MEGIS) website, including parcel data, existing topography, and aerial photography.

This report and the attendant preliminary cost projections were prepared on the basis of the information obtained and reviewed as part of the work outlined above. The preliminary cost projections represent the team of consultants' professional opinions derived on experience in similar projects. In completing these estimates we have made certain assumptions regarding the possible regulatory requirements that may be imposed and/or the weather conditions that may be present at the time work is conducted, both of these are conditions that are latent and beyond our direct control. In some cases, we have added specific contingencies reflecting scope and/or cost uncertainties. These estimates should not be considered guaranteed maximum costs or the equivalent of proposals to actually complete this work.

SECTION 1

EXISTING LEGAL CONDITIONS

1.1 Background

The Mitchell Field Marine Business District (MFMBD) is located at the northern end of the Mitchell Field site, located off State Route 123 (SR123) in Harpswell. Mitchell Field was formerly owned by the U.S. Government and operated by the U.S. Navy as a fueling depot for the Brunswick Naval Air Station.

Ownership of the majority of the site (approximately 118.5 acres) was transferred to the Town of Harpswell in 2001 after the Navy decommissioned the facility and completed a comprehensive program of environmental testing and cleanup. At the time of transfer, several restrictive covenants were included in the deed, aimed at limiting the Navy's liability related to residual soil or groundwater contamination resulting from the Navy's use of the site. Subsequently, in 2005 the remaining parcel (approximately 0.82 acres) associated with the Navy Family Housing adjacent to Harpswell Neck Road was transferred to the Town of Harpswell. This second land transfer is not located with the portion of Mitchell Field designated by the Town as Marine Business District; therefore, this parcel has no direct impact on the intended uses or redevelopment within the MFMBD. It should be noted that the restrictive covenants on the Navy Family Housing parcel are less restrictive than those placed on the 2001 transfer.

The Town of Harpswell created the MFMBD at the north end of Mitchell Field in an effort to attract marine dependent commercial and industrial businesses to the site. Development within Mitchell Field and the MFMBD is governed by local ordinances and is subject to the covenants referenced above.

1.2 Discussion

Local Zoning:

Lot standards within the MFMBD are governed by the Town of Harpswell's Shoreland Zoning Ordinance, and are summarized in the table below.

LOT STANDARDS WITHIN MFMBD	
Minimum Lot Size	20,000 s.f.
Minimum Shore Frontage[1]	150 ft.
Minimum Road Frontage	150 ft.
Maximum Structure Height	30 ft.
Area per Principal Structure	20,000 s.f.

[1] If more than one principal structure is located on a lot within 250' of the high water line, the lot must meet minimum shore frontage requirements for each principal structure.

LOT STANDARDS WITHIN MFMBD	
Minimum Setback from Shore[2]	0 ft.
Minimum Setback from Upland Perimeter Property Boundary[3]	50 ft.
Maximum Lot Coverage[4]	70%

Land use activities allowed in the MFMBD are also governed by the Shoreland Zoning Ordinance. A broad range of marine related, non-residential uses are allowed within the MFMBD by right or with the approval of the Planning Board or Local Plumbing Inspector or Code Enforcement Officer.

Deeds:

1. The current Quitclaim Deed for the majority of the Mitchell Field site (Attachment A-1) containing approximately 118.5 acres, dated October 22, 2001, includes several restrictive covenants related to environmental conditions on the site. The covenants are listed and summarized below:

    a. Covenant and Restriction Regarding Residential Use: This covenant prohibits residential uses on this portion of the Mitchell Field site without written approval from the Maine Department of Environmental Protection (MeDEP). Because residential uses are not currently allowed in the MFMBD, and we do not believe that the Town of Harpswell has any interest in developing residential uses within the MFMBD, this covenant is not considered relevant to the scope of this report.

    b. Covenant and Restriction Regarding Use of Groundwater: This covenant includes a limit on the use of groundwater from the new water supply well (NWSW) to less than 450 gallons per day (gpd) without prior written approval of MeDEP. We understand that this use restriction originally was established for proposed drinking water use for recreational visitors. We understand that in a letter dated September 15, 2008 (Attachment A-3), MeDEP provided written approval for use of the well at pumping rates up to 6.25 gallons per minute (gpm), or about 9,000 gpd, subject to conditions including:

        - The Town must secure a permit to activate the well for an intended use given that the well has been inactive for over 3 years;
        - Two years of quarterly monitoring of the raw water and select monitoring wells for gasoline and diesel range organics (GRO and DRO);
        - Preparation of a contingency plan for treating the water should fuel constituents be detected in the water from the well; and

[2] For marine related businesses, see Section 15.2.1.1 of the Shoreland Zoning Ordinance.
[3] Section 15.2.1.6 of the Shoreland Zoning Ordinance.
[4] Includes structures, driveways, parking lots, & other impermeable surfaces. See Section 15.2.4 of the Shoreland Zoning Ordinance.

- If greater use of this well or other water supply development is desired by the Town the MeDEP will require supporting hydrogeologic studies.

The MeDEP approval of use up to 6.25 gpm was granted based on the findings of pumping tests and water quality analyses conducted in 1998 and 2001, installation and testing of additional monitoring wells by a consultant for MeDEP, and geophysical testing and groundwater modeling also conducted under MeDEP direction.

In a letter dated November 16, 2010 (Attachment A-4), MeDEP indicated that future testing of the water supply well should include testing for volatile and extractable petroleum hydrocarbons (VPH and EPH) instead of the GRO and DRO testing that had been conducted in the past. This MeDEP input reflects a change in cleanup standards for soil and groundwater, adopted in 2009, based on alternate analyses for VPH and EPH[5]. By 2009 much of the site remediation had been completed.

More information on the NWSW, including testing requirements and recommendations, are included in Section 3 of this report.

c. Covenant and Restriction Regarding Subsurface Excavation: This covenant prohibits any subsurface excavation, digging, drilling, exploration, or construction on the parcel without prior written approval from MeDEP. In a letter dated November 16, 2010 (Attachment A-4), MeDEP reiterated this restriction, indicating that "limited environmental sampling by the Town" or other party would be necessary to demonstrate that digging did not pose an unacceptable health risk. This letter also described other considerations and conditions for participation in the Maine Voluntary Remedial Action Program (VRAP).

Although we have not directly discussed the details with MeDEP, we believe that this restriction could be addressed through development and execution of a soil testing and management plan.

This plan would govern the field screening and laboratory testing of soils for petroleum residuals as a part of site engineering or construction work. The plan would consider the available data on historical characterization, and present MEDEP policies for investigation and remediation of petroleum containing soils. The plan would outline procedures for either pre-screening soils that may be disturbed during construction or screening and testing of soils during construction.

The plan would also outline potential options for disposition of petroleum residual soils focused to the extent practicable toward returning such soils to the subsurface within the general area of origination but could also outline conditions for considering off-site disposal or low on-site treatment such as land farming.

[5] Maine DEP, November 20, 2009, Remediation Guidelines for Petroleum Contaminated Sites In Maine.

Under Covenant 2 of the Quitclaim Deed, it appears that the U.S. Government would be responsible for any additional remedial action found to be necessary that is not the result of actions conducted by future occupants of the property. It is not clear if this accepts responsibility for remediation necessary to support future uses of the site. If this was the case, as an example, the Government could be responsible for disposition of residual petroleum containing soils that may be disturbed in utility installation or other construction. The Town may wish to obtain a legal opinion on this matter.

Provided in Table 1-1 is a preliminary opinion of cost for preparation of a soil testing and management plan (Line 2) and possible unit costs for implementing such a plan. In preparing these estimates, it was assumed that all soil will remain on site. It is expected that there will be opportunities to place and cover contaminated fill (if found) within the MFMBD if the site is graded in accordance with the conceptual grading plan (Figure 5-1) presented in Section 5 of this report. Line Items 3, 4, 5, and 6 in Table 1-1 outline possible unit costs for either pre-screening or screening and testing of soils during construction. The costs are presented on the basis of linear footage of water line or square footage of building or other footprint and could be applied to different development concepts. The cost opinions were derived with certain concepts regarding how work would be conducted without material input from MeDEP and may or may not be conservative depending on the nature of the development relative to known historical petroleum presence and regulatory input. Should the Town or potential lessee elect to pursue such a plan, we recommend initially meeting with MeDEP to present and discuss plan concepts before moving forward. Costs associated with soil testing during construction have also been incorporated into the estimates presented in other sections of this report.

It is our opinion that the past remediation conducted by the DLA was a relatively comprehensive and responsible effort that included the excavation and treatment of large volumes of soil that should have substantially removed the bulk of the petroleum mass in soils. The cleanup targeted removal of soils containing concentrations at or above 870 milligrams per kilogram DRO/GRO leaving behind some petroleum residuals at lower concentration. It is our opinion that the historical remediation achieved cleanup above and beyond what would have been conducted to meet present soil cleanup standards established based on VPH/EPH with the goal of protection of groundwater. However, it should be recognized that some petroleum residuals still reside in soil, bedrock, and groundwater beneath the site.

The most recent report summarizing groundwater monitoring conducted by the DLA, dated September 2011[6], indicated that with the regulatory change to cleanup standards based on VPH/EPH, groundwater monitoring has indicated

[6] TK&K Services, September 2011, 2011 Annual Groundwater Monitoring Report, Former Defense Fuel Support Point, Mitchell Field, Prepared for the Defense Logistics Agency-Energy, Fort Belvoir, VA.

conditions meeting cleanup goals for petroleum, but still exhibiting detectable concentrations of DRO exceeding the prior Maine Exposure Guideline of 50 µg/L at the locations shown on Figure 3-1.

The practical implications of these data is that while the available groundwater monitoring data may indicate water quality meeting present health-based cleanup guidelines, water in certain areas may still contain sufficient residuals of petroleum to result in petroleum tastes and/or odors and the water may also exhibit elevated dissolved metals that in part could reflect naturally occurring metals in soil and rock and increased solubility of metals under geochemical conditions resulting from petroleum residuals. The presence of metals such as iron (Fe), manganese (Mn) and other metals in groundwater at the site may necessitate pretreatment of the water to limit taste, odor, and staining/fouling of piping and plumbing fixtures.

The area shown encompassed by dashed green line on the attached Figure 3-1 is intended to depict an area inferred by Sanborn Head as more likely to produce impaired water quality as a context for the discussion of water supply development alternatives. The area was inferred in consideration of the reference water quality monitoring reports, and apparent groundwater flow directions as inferred by others. This depiction is not meant to convey that groundwater within these bounds will not meet primary drinking water standards or petroleum cleanup guidelines, but is intended to indicate where based on the available data, it is more probable that water quality will reflect some impairment that could at a minimum be a consideration for treatment due to potential taste, odor, or other secondary concerns.

The 2011 DLA annual monitoring report recommended termination of sampling for VPH and DRO and abandonment of a number of wells. We understand that MeDEP may have approved these changes to the monitoring program, although we did not find specific record of that approval. It is our opinion that some of the monitoring wells slated for abandonment could be useful to the Town for monitoring of water supply production from NWSW or alternate well locations.

2. The current Quitclaim Deed for the remaining portion of the Mitchell Field site associated with the former Navy Family Housing parcel containing approximately 0.82 acres (Attachment A-2), dated September 14, 2005, includes covenants related to environmental conditions similar to the parcel transferred in October 21, 2001; however, the covenants restricting residential use, use of groundwater, or subsurface excavation do not apply to this parcel. The covenant associated with this parcel is listed and summarized below:

   a. <u>Covenant and Restriction on Water Supply Wells:</u> This covenant requires the installation of an appropriate water treatment system, as determined necessary, prior to allowing groundwater to be drawn from the water supply wells on this parcel for human consumption.

1.3 MeDEP Voluntary Response Action Program (VRAP) Program

In a letter dated November 16, 2010 (Attachment A-4), MeDEP provides an outline for participating in the VRAP program, which may offer the Town of Harpswell protection from future MeDEP enforcement action should additional environmental contamination be found on the site. MeDEP indicates that the town's current plan for redevelopment of the Mitchell Field site is compatible with the Department's understanding of potential and real environmental issues.

The specific conditions for participation in the program outlined in the letter are very similar to those imposed by the restrictive covenants located in the property deed and described above. We recommend that the Town of Harpswell meet with MDEP staff to further discuss participation in the VRAP program once a tenant or use has been found for the MFMBD.

1.4 Recommendations

The following recommendations are associated with the existing legal conditions on the site with respect to future development within Mitchell Field and the MFMBD:

A. Preparation of Soil Testing and Management Plan Total Opinion of Cost = $20,000

It is our opinion that the preparation of a soil testing and management plan will address the deed covenant restriction regarding subsurface exploration.

The soils testing and management plan will establish guidelines for field screening and laboratory testing of soils associated with subsurface excavation, drilling, exploration or construction throughout the Mitchell Field site.

Table 1-1
Preliminary Estimates of Probable Cost - Soils Testing Requirements
Preliminary Infrastructure Planning Mitchell Field Marine Business District
Harpswell, Maine

Line Item No.	Description	Estimate of Probable Capital Cost	Nature of Estimate	Basis/Rationale
1	**Work Related to Soil Testing for Petroleum Under the Covenant and Restriction for Subsurface Excavation**			Development and application of a soil testing and management plan to facilitate subsurface excavation for site engineering investigations or construction under the Quitclaim Deed Covenant and Restriction on Subsurface Excavation
2	Preparation of Soil Testing and Management Plan	$20,000	Top Down Estimate	Development and submittal of a written plan to MEDEP to govern the completion of excavation work at the site under the restriction on subsurface excavation. The plan would outline procedures for with pre-screening areas for petroleum residuals in soil based on either test pit explorations or borings and a rationale for management of soils disturbed during construction. It is assumed that the report would be formatted for submittal to MEDEP. Once MEDEP approval was obtained on the plan document, excavation could be conducted within the guidelines of the plan. The estimated cost was prepared assuming a draft and final report and meetings with MEDEP to discuss the approach and obtain approval of the final document
3	Soil Testing - Building or Other Footprint (10,000 sf)	$6,000	Top Down Estimate	Assuming drilling or test pitting to be conducted under the review of a qualified professional meeting the requirements of OSHA Hazwoper Rules 1910.120. Collection and screening of soils using MDEP approved methods for field PID and Dye Shake Test methods. Assuming depth of explorations of 20 feet or less and approximately four to six boreholes or test pit excavations in a working day, plus confirmatory lab testing of eight representative soil samples.
4	Soil Testing - Water Line or Other Utility Excavation per 500 feet	$6,000	Top Down Estimate	Assuming drilling or test pitting to be conducted under the review of a qualified professional meeting the requirements of OSHA Hazwoper Rules 1910.120. Collection and screening of soils using MDEP approved methods for field PID and Dye Shake Test methods. Assuming depth of explorations of 20 feet or less and approximately four to six boreholes or test pit excavations in a working day, plus confirmatory lab testing of eight representative soil samples.
5	Reporting Soil Testing Events	$4,000	Top Down Estimate	Estimated cost for preparation of letter or memoranda report outlining the findings of soil testing under an approved soil testing and management plan
6	Field Observation of Soil Excavation - Day Rate for Individual Excavation Events	$1,500	Top Down Estimate	Day rate for monitoring of soil excavation during construction by a qualified engineer/geologist, travel costs and day rates for equipment and expendables.

Notes:
1. This table outlines opinions of probable cost for items related to potential development of a Marine Business District (MBD) at Mitchell Field in Harpswells Maine.
2. The estimates reflect the team of consultants' professional opinion as to the magnitude of probable cost. As noted in the table, some line items are contingencies that reflect possible scope and cost uncertainty consistent with preliminary estimates. The Town should consider the possibility of adding additional contingency reflecting their risk management preferences. Please refer to the report text and figure for addtional supporting information and limitations.

SECTION 2

ROADWAY ACCESS

2.1 Background

Vehicular access to the Mitchell Field Marine Business District (MFMBD) is provided via a 3,800 linear foot paved access road across the Mitchell Field site with connection to Harpswell Neck Road (SR 123). As part of the Mitchell Field Preliminary Infrastructure Assessment Study, the conditions of the existing roadway system were reviewed to identify areas for recommended improvements to facilitate access to the MFMBD. As discussed in our proposal, there are no known tenants for the MFMBD; therefore, our evaluation is based upon the assumption that access will be required for larger semi-trailer trucks thereby covering a broad spectrum of potential users.

The Mitchell Field Master Plan also identified the potential relocation of the Mitchell Field access road to the southerly side of the Town's fire station. The roadway infrastructure assessment included a budgetary opinion of cost for this alternative roadway alignment in the long-term planning for the site; however, this roadway relocation is not considered associated with the development of MFMBD.

The existing right-of-way along Harpswell Neck Road (SR 123) beyond the limits of Mitchell Field are based upon the Town's GIS data; therefore, any areas of additional right-of-way acquisition discussed below are not based upon actual field survey and shall be considered approximate. Further verification of the actual right-of-way and areas of acquisition are beyond the scope of this study and shall be confirmed by the Town of Harpswell. The cost associated with any offsite land acquisition is beyond the scope of this preliminary infrastructure assessment study; however, for the purposes of this assessment we have used an acquisition cost of $50,200 per acre, which is based upon the median per acre land appraisal value from the Town's Assessor data base. The actual cost for any offsite land acquisition will need to be confirmed by the Town.

2.2 Discussion

On December 6, 2011, we visited the site to assess the conditions of the onsite roadway system as well as site access issues along SR 123. The existing posted speed limit along SR 123 is 40 mph north of the Town's fire station and reduces to 30 mph south of the Town's fire station. Figure 2-1 provides an overview of the posted speed limits along SR 123 and available site line distances at the existing and potential relocated site access into Mitchell Field. A detailed summary of our findings is provided below:

MF Site Access from SR 123

Harspwell Neck Road (SR 123) is a state roadway that is maintained by the Maine Department of Transportation (MDOT). Access onto the state route is controlled by

MDOT and should be designed to meet MDOT's minimum requirements as set forth in the Department's Highway Design Manual.

A. Existing Site Entrance

The existing site entrance onto SR 123 is located approximately 400' northerly of the Town's fire station. As mentioned above, the posted speed limit at this location is 40 mph, which requires a minimum sight distance of 445'. The available sight line distance to the south of the site entrance is approximately 800', which exceeds the minimum requirement. The available sight line distance to the north of the site entrance is approximately 255', which does not meet the minimum sight line distance for the current posted speed limit.

Four options are presented below for improving the sight line distance north of the existing site entrance road:

- Option 1 – Maintain Location of Existing Site Entrance and Remove Obstructions within Required Site Line Area for 40 mph Posted Speed Limit

  Figure 2-2 depicts the area of additional right-of-way\land acquisition that would be necessary to enable the Town to remove any existing obstructions within the 445' minimum sight line distance associated with the 40 mph posted speed limit zone at the existing site entrance. As shown on Figure 2-2, the additional land acquisition area encompasses approximately 0.1 acre of abutting land owned by others. The anticipated cost associated with this option is $8,550.

- Option 2 – Relocate Site Entrance and Remove Obstructions within Required Site Line Area for 40 mph Posted Speed Limit

  Figure 2-3 depicts a conceptual relocation of the existing site entrance road by approximately 100' in a southerly direction. Based on the town's GIS mapping information, the relocation of the access road into the site eliminates the need to acquire additional right-of-way\land and reduces the area that must be cleared of obstructions within the 445' minimum sight line distance associated with the 40 mph posted speed limit zone.

  This conceptual site access road relocation would result in the reconstruction of approximately 200 linear feet of access road as well as encroachment into the parcel associated with the former naval housing unit (building 162). The anticipated cost associated with this option is $54,050.

- Option 3 – Further Relocation of Site Entrance and Remove Obstructions within Required Site Line Area for 40 mph Posted Speed Limit

  Figure 2-4 depicts a conceptual relocation of the existing site entrance road by approximately 190' in a southerly direction, which provides the necessary sight

line distance for the 40 mph posted speed limit without the need for any removal of obstructions within the required sight line.

This conceptual site access road relocation would result in the reconstruction of approximately 350 linear feet of access road, resulting in a roadway alignment between the two former naval housing units (buildings 162 and 163). The anticipated cost associated with this option is $90,800.

- Option 4 – Maintain Location of Existing Site Entrance and Remove Obstructions within Required Site Line Area for Reduced Posted Speed Limit of 30 mph

  The Town could request that the MDOT extend the 30 mph posted speed limit along SR 123 approximately 1,000 feet northerly of the current location thereby reducing the minimum sight line distance to 335'. Based on the Town's GIS mapping information, reducing the speed limit on SR 123 to 30 mph in front of the site eliminates the need to acquire additional right-of-way\land for clearing obstructions. Figure 2-5 depicts the area in which obstructions would need to be removed within the 335' minimum sight line distance. The anticipated cost associated with this option is $3,550.

B. Potential Relocated Site Entrance

The potential relocated site access as shown on the Mitchell Field Master Plan is approximately 150' southerly of the Town's fire station. At this location, the available sight line distance in either direction is more than 900'. In order to achieve these sight line distances, several large maple trees will need to be removed on either side of the relocated site entrance. These trees appear to be within the Mitchell Field property or within the SR 123 right-of-way; however, this should be confirmed by formal survey.

As shown on Figure 2-6, the conceptual site access road relocation would result in the reconstruction of approximately 600 linear feet of access road at an anticipated cost of $223,500.

C. Interior Access Road

The primary interior access road (approximately 3,800 linear feet in length) within Mitchell Field consists of a paved roadway surface having a width of 26' with 8' wide gravel shoulders on either side of the roadway surface. Based upon the historical plans available from the Town Planning Office, the original roadway construction consisted of 2½" of bituminous pavement, 3" of crushed base gravel and 12" of subbase gravel. The majority of the roadway is served by open drainage swale system along each side of the roadway with intermittent cross culverts as necessary to facilitate the open drainage system.

Based upon recent observations at the site, it appears the roadway surface was previously overlayed resulting in a pavement thickness of approximately 3" to 3½".

A photographic record of the pavement condition along the primary access road is provided in Attachment B. In general, the planarity of the roadway surface is in remarkably good condition, which indicates the pavement structural section and drainage system is adequate for the previous level of traffic loads. The pavement surface is somewhat fatigued and cracked, which is primarily a function of the age of the pavement. There are several areas of previous trenching across the existing roadway that are in need of repair; however, it is our opinion that the pavement section is adequate to support the anticipated traffic needs for the development within the MFMBD.

Maintenance is required for all roadway surfaces. Based upon the conditions of the current roadway system, our office has prepared three scenarios for improving the roadway surface and extending the service life of the pavement section.

- Scenario 1 – Minimal Level

  This scenario includes restoration of the limited pavement surfaces disturbed by previous trenching excavations across the existing pavement section as well as crack sealing\filling the entire roadway surface. This scenario is anticipated to extend the pavement surface life by approximately 2 to 3 years before repeating or performing more extensive pavement restoration work similar to Scenarios 2 and 3 below. The anticipated cost associated with this scenario is $30,250.

- Scenario 2 – Moderate Level

  This scenario includes the work associated with Scenario 1 along with the installation of pavement reinforcement fabrics prior to the placement of a 1½" bituminous overlay. This scenario is anticipated to extend the pavement surface life by approximately 5 to 7 years before repeating or performing more extensive pavement restoration work similar to Scenario 3 below. The anticipated cost associated with this scenario is $189,200.

- Scenario 3 – Partial Reconstruction

  This scenario includes a full depth grind of the existing bituminous pavement materials that will increase the thickness and strength of the existing base gravel section beneath the roadway before placement of full depth pavement section consisting of 2" of binder pavement and 1½" of surface pavement. This scenario is anticipated to provide a useful pavement life span of 15 to 20 years before performing preventative pavement maintenance, such as crack sealing, pavement overlay, etc. The anticipated cost associated with this scenario is $301,950.

2.3 Recommendations

The following recommendations are provided with respect to improving the roadway access to support development within the MFMBD:

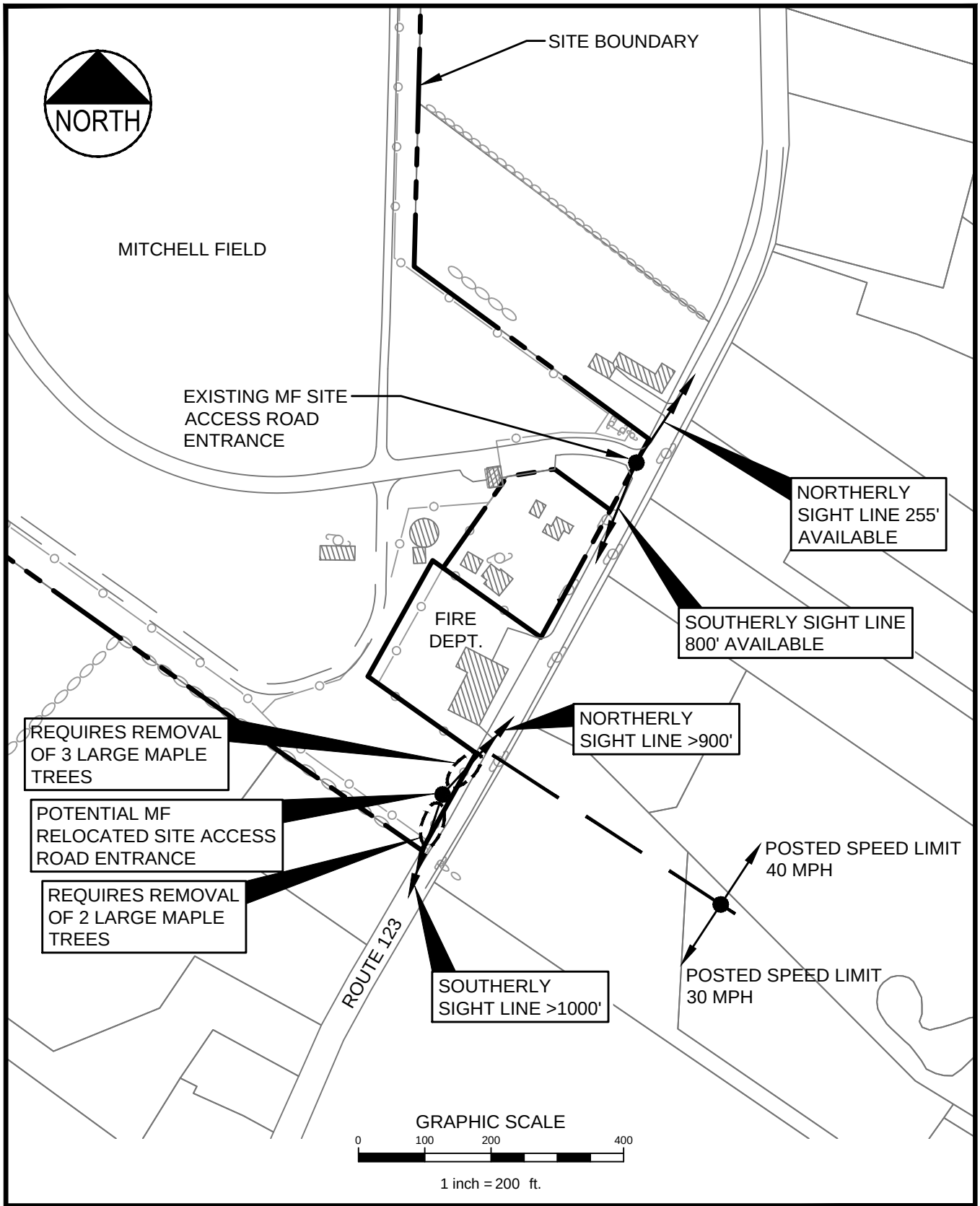
A. Site Entrance – Option 4: Total Opinion of Cost = $3,550.00

This option is the recommended course of action to the Town as it represents the most cost effective approach to improving the site access to Mitchell Field and maintains the existing character of the site from Harpswell Neck Road.

B. Interior Access Road – Scenario 3: Total Opinion of Cost = $301,950.00

The partial reconstruction scenario is recommended as the most prudent and cost effective approach; however, implementation of this work should be anticipated to occur within a 3 to 5 year period after the MFMBD is redeveloped.

The existing interior access road condition appears to be sufficient to support vehicular traffic for the short term future. In the immediate future, it is recommended that the Town implement limited repairs to the pavement surfaces disturbed by previous trenching excavations ($5,000) then continue to monitor the pavement surface condition on an annual basis to observe changes in the roadway condition as a result of increased traffic and vehicular usage associated with the development within the MFMBD. Based upon the annual monitoring, the Town should anticipate completing the partial reconstruction work within a 3 to 5 year period after development within the MFMBD, which will allow the Town several years to allocate the funds for this work.



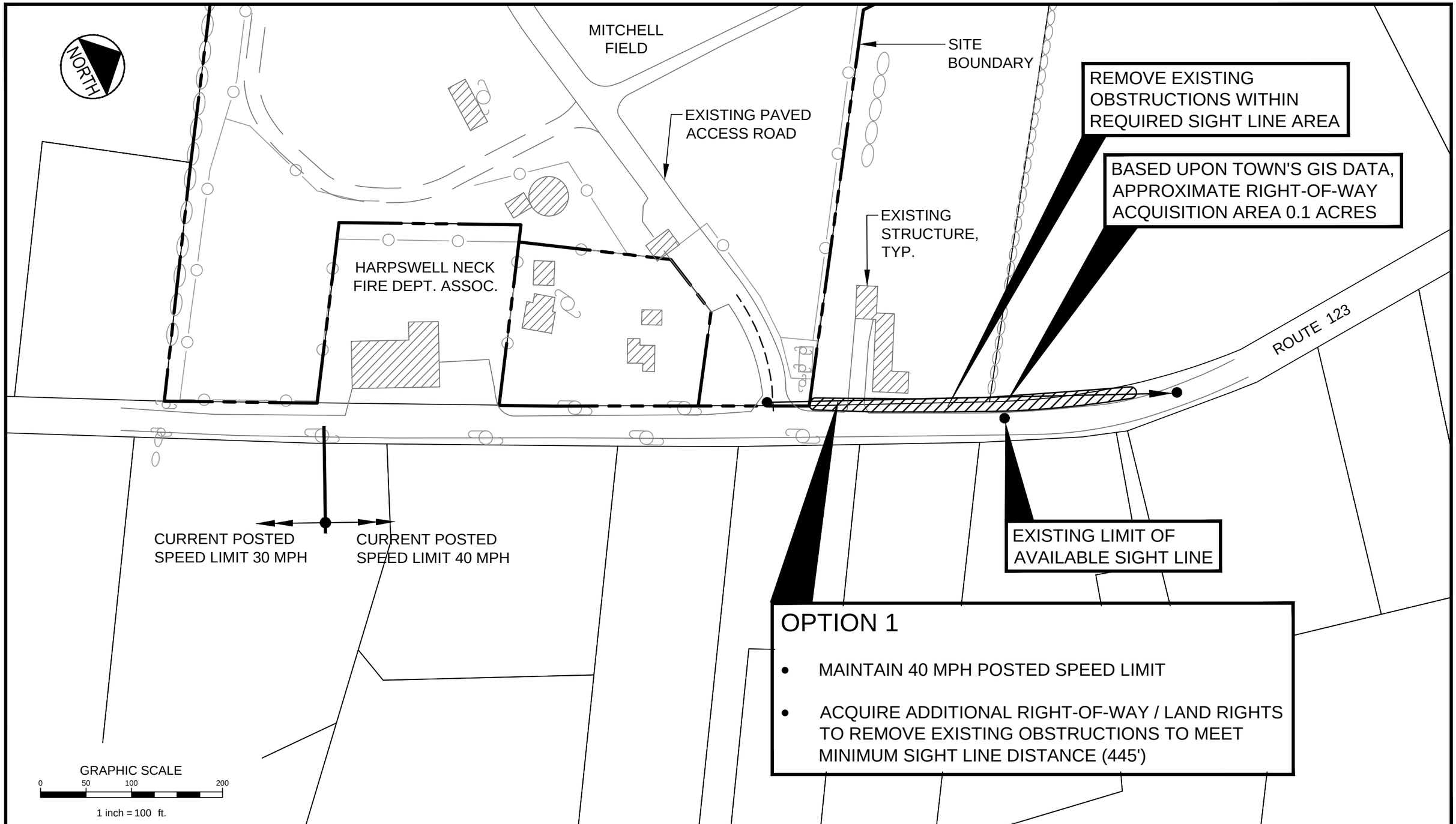
MITCHELL FIELD (MF)
HARPSWELL, MAINE

AVAILABLE SIGHT DISTANCES

DeLuca-Hoffman Associates, Inc.
778 MAIN STREET, SUITE 8
SOUTH PORTLAND, ME 04106
207.775.1121
WWW.DELUCAHOFFMAN.COM

DRAWN:	CDD	DATE:	FEB. 2012
DESIGNED:	JAL	SCALE:	1" = 200'
CHECKED:	JAL	JOB NO.	3059.01
FILE NAME:	3059-PROPOSED BASE		

FIGURE
2-1



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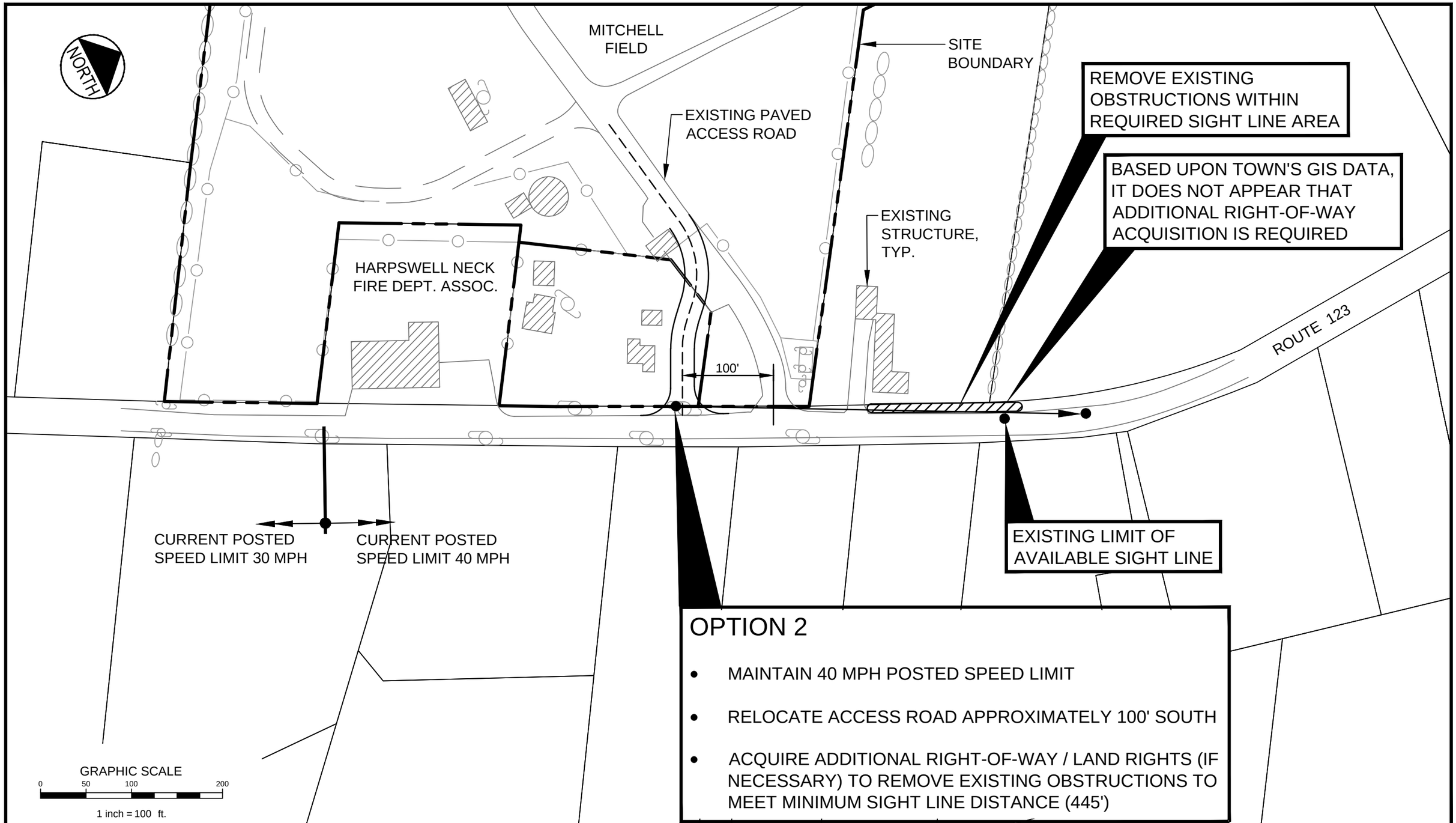
DRAWN:	CDD	DATE:	FEB. 2012
DESIGNED:	JAL	SCALE:	1" = 100'
CHECKED:	JAL	JOB NO.	3059.01
FILE NAME:	3059-PROPOSED BASE		

MITCHELL FIELD
HARPSWELL, MAINE

SITE ENTRANCE OPTION 1

FIGURE
2-2



OPTION 2

- MAINTAIN 40 MPH POSTED SPEED LIMIT
- RELOCATE ACCESS ROAD APPROXIMATELY 100' SOUTH
- ACQUIRE ADDITIONAL RIGHT-OF-WAY / LAND RIGHTS (IF NECESSARY) TO REMOVE EXISTING OBSTRUCTIONS TO MEET MINIMUM SIGHT LINE DISTANCE (445')

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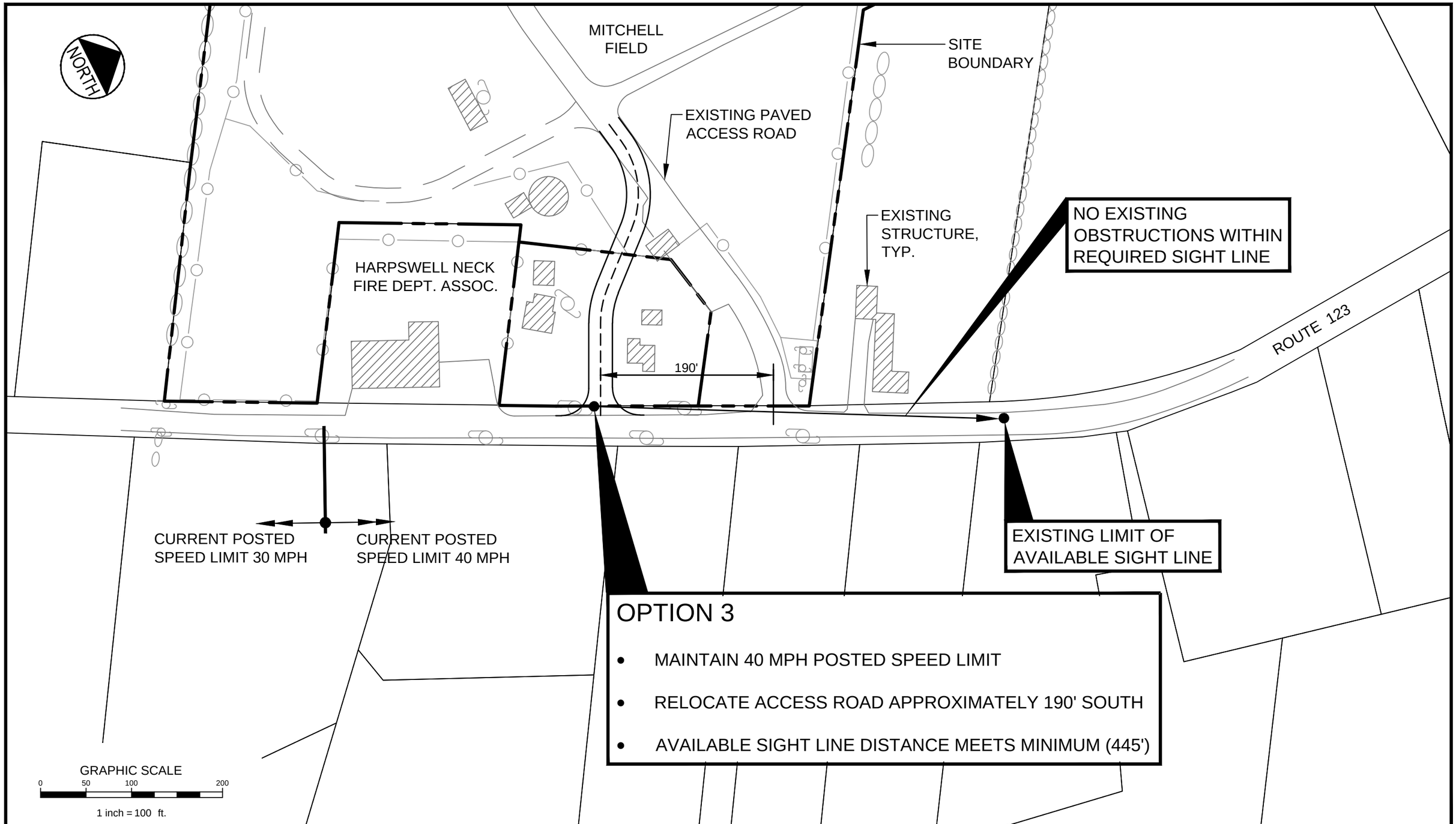
DRAWN:	CDD	DATE:	FEB. 2012
DESIGNED:	JAL	SCALE:	1" = 100'
CHECKED:	JAL	JOB NO.	3059.01
FILE NAME:	3059-PROPOSED BASE		

MITCHELL FIELD
HARPSWELL, MAINE

SITE ENTRANCE OPTION 2

FIGURE
2-3



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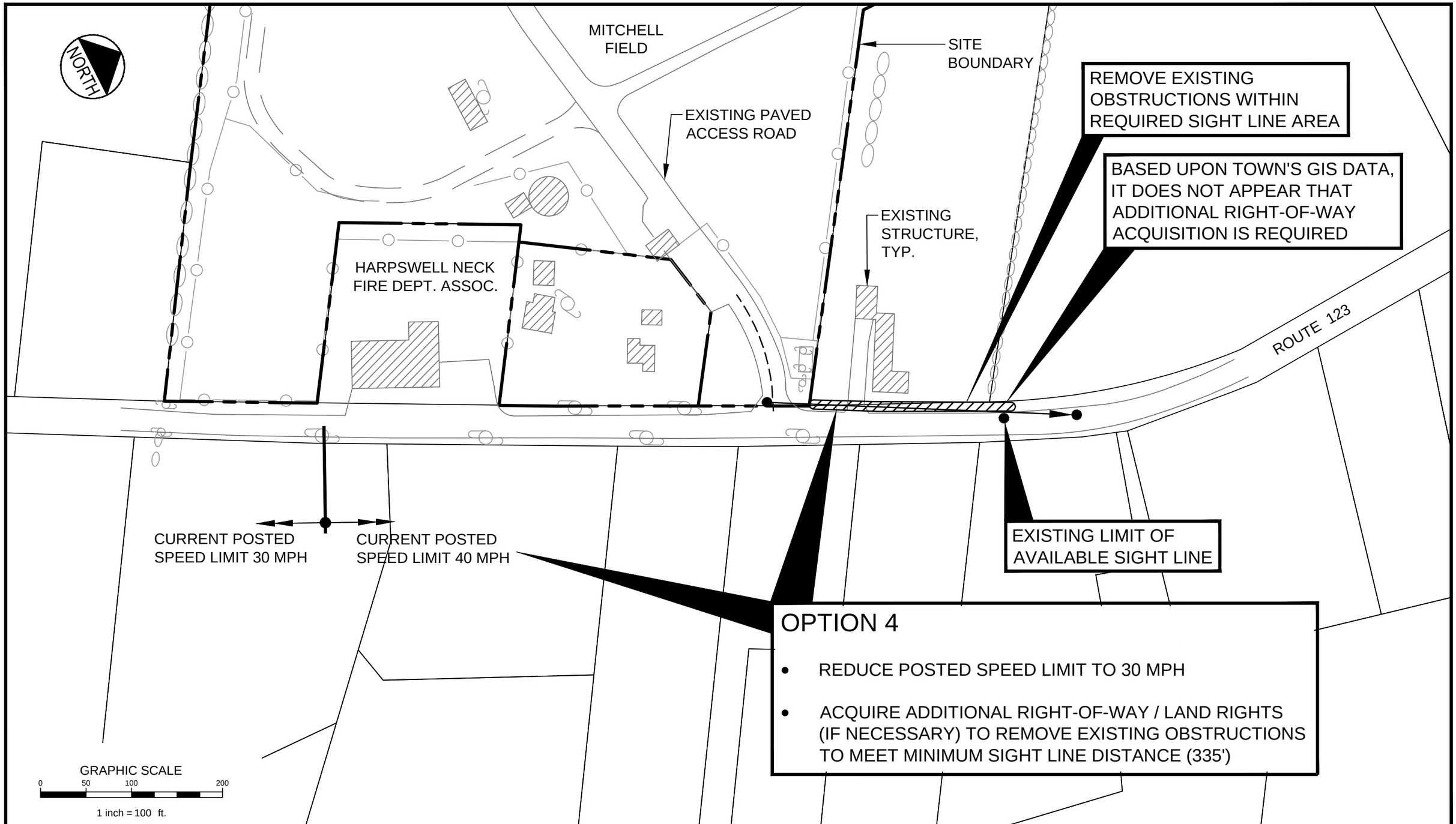
DRAWN:	CDD	DATE:	FEB. 2012
DESIGNED:	JAL	SCALE:	1" = 100'
CHECKED:	JAL	JOB NO.	3059.01
FILE NAME:	3059-PROPOSED BASE		

MITCHELL FIELD
HARPSWELL, MAINE

SITE ENTRANCE OPTION 3

FIGURE
2-4



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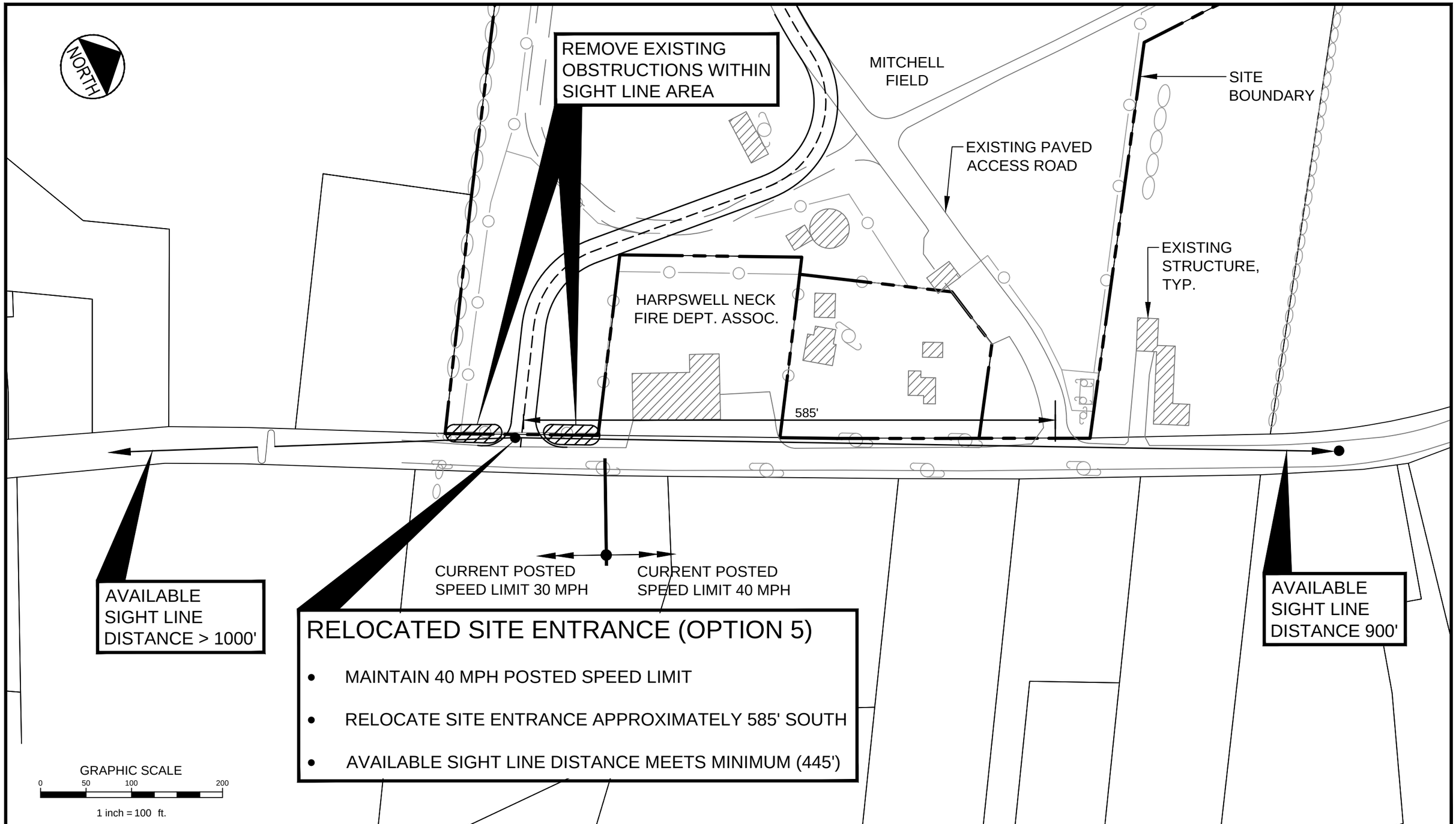
DRAWN:	CDD	DATE:	FEB. 2012
DESIGNED:	JAL	SCALE:	1" = 100'
CHECKED:	JAL	JOB NO.	3059.01
FILE NAME:	3059-PROPOSED BASE		

MITCHELL FIELD
HARPSWELL, MAINE

SITE ENTRANCE OPTION 4

FIGURE
2-5



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DRAWN:	CDD	DATE:	FEB. 2012
DESIGNED:	JAL	SCALE:	1" = 100'
CHECKED:	JAL	JOB NO.	3059.01
FILE NAME:	3059-PROPOSED BASE		

MITCHELL FIELD
HARPSWELL, MAINE

RELOCATED SITE ENTRANCE
AS RECOMMENDED IN MF MASTER PLAN

FIGURE
2-6

SECTION 3

WATER SUPPLY & SANITARY WASTEWATER DISPOSAL

3.1 Water Supply

3.1.1. Background

We understand that the Town holds final approval for a non-transient non-community water supply well denoted as "New Water Supply Well" that has been proven to yield nearly 13 gpm in sustained pumping, or about 18,000 gallons per day (gpd). The well designated by DHHS as #94688 and referred to as NWSW was permitted by DHHS for about 12 gpm or about 17,300 gpd through a final new source approval granted on July 18, 2000. Figure 3-1 depicts the well location and the required 300 foot setback to possible sources of contamination. We did not find a copy of the final approval letter from DHHS. We understand that piping from the well may already be plumbed to the historical water treatment building shown on Figure 3-1 but did not find precise documentation to confirm this.

Analysis of water quality samples collected during several pumping tests conducted on the NWSW in 2008 (48-hrs) and 2001 (72-hrs) did not find volatile organic compounds or petroleum hydrocarbons (DRO and GRO) as shown on Attachment C-1. The samples did exhibit concentrations of total iron exceeding the secondary drinking water standard maximum contaminant level (SMCL) established for aesthetic effects such as taste, odor, and staining of plumbing fixtures. Manganese was also found at concentrations just below the SMCL for this metal and Arsenic was found at concentrations about an order of magnitude below the primary drinking water standard MCL. Sodium was found at concentrations exceeding the SMCL which may reflect the upslope or historical nearby use of deicing salts.

As discussed in Section 1 of this report, MeDEP has provided written permission to use the well subject to a maximum withdrawal of about 6.25 gpm, or about 9,000 gpd, and a period of quarterly monitoring for petroleum and VOCs. The Town will also need to obtain a permit to activate the well and have a contingency plan for providing treatment for fuel constituents if found to be present in the water supply during operation.

Under Maine State Rules, domestic water and wastewater needs for a facility with 75 employees/visitors/guests would be 15 gallons per person per day, or about 1,125 gallons per day. As such at the MeDEP Conditions of Use, nearly 7,900 gpd capacity or about 55,000 gallons per week would be available for process or other needs at the approved withdrawal rate. At the DHHS approved withdrawal rate 12.5 gpm (over 16,000 gpd) about 113,000 gallons per week would be available.

3.1.2. Discussion

New Water Supply Well

NWSW has been shown through several pumping tests to be a high yield well producing water free of detectable petroleum constituents. The yield is sufficient to support the defined domestic and some non domestic process water needs for the MBD within the withdrawal limit condition established by MeDEP. While the use of this well at or below this withdrawal limit is not a guarantee of petroleum free water quality:

- The available groundwater monitoring data for the area does not suggest the nearby presence of gross petroleum contamination to source such a condition.

- This well has been subject to extended pumping at about twice the permitted rate without detection of DRO or VOCs.

- The well is located about 750 to 900 feet away from the nearest principal sources of contamination, the former landfill and upper tank farm area. Infiltration of water from a small drainage feature between the well and the upper tank farm may limit potential for pumping of this well to draw in groundwater from the vicinity of the upper tank farm area.

- Numerical groundwater modeling conducted by MeDEP to look at possible flow patterns under greater withdrawal indicated that at pumping rates over 12 gpm, it is possible that the well could capture water flowing beneath the nearest former soil contamination area (T-10) to the northeast where recent monitoring has not indicated detectable DRO or VPH. This result is an educated estimate and is not a certainty. It is our opinion that greater withdrawal to the well capacity may be possible without materially changing the quality of water supplied. Under conditions established by MeDEP, such use may require additional monitoring and/perhaps hydrogeologic studies and/or monitoring and increase the probability of the need to provide for organics treatment.

We believe that it is prudent to include a contingency for treatment for petroleum regardless of the water supply well location to address either taste or odor problems due to petroleum issues, particularly if MBD tenant or combined tenants have greater process water needs that exceed the MeDEP Conditions of Use. Pretreatment of the water to remove iron and manganese is likely warranted to limit potential for fouling of petroleum treatment units, presumably activated carbon.

Absent treatment for organics, it may be warranted to provide for iron removal treatment near the source well, given the length and potential for iron fouling of the line and/or provisions for cleaning the transmission line. Near source treatment would require a heated enclosure to house the treatment equipment and perhaps a storage tank and pump for water distribution to the MBD.

Options for supplying domestic water from the NWSW to the MFMBD include the following two options:

a. Open Cut Trench Excavation:

This option includes installing approximately 3,500 linear feet of 2" water supply line from the new water treatment building to the MFMBD along the shoulder of the existing access road. The water line installation would be performed using standard open trench excavation measures, which will require soils monitoring and testing. The anticipated cost associated with this option is $286,000, which includes $60,000 for the installation of a new 20'x 20' prefabricated building to house the water quality treatment equipment (Table 3-1, Lines 8 and 9A).

b. Slip-line Installation Within Existing Abandoned Gravity Sewer Main

This option includes re-use of the abandoned gravity sewer main as a conduit for slip-lining the new 2" water line along the existing access roadway from the new water treatment building to the MFMBD. Upon completion of the water main installation, the existing sewer manhole tops would be removed 3' below ground surface, filled with sand and the pipeline annular space filled with flowable fill. Because of the limited excavation and soils disturbance associated with this option, the levels of contaminated soils monitoring and testing are less than Option A, outlined above. The anticipated cost associated with this option is $134,000, which includes $60,000 for the installation of a new 20'x 20' prefabricated building to house the water quality treatment equipment (Table 3-1, Lines 8 and 9B).

Figure 3-2 depicts the location of a new water treatment building at the terminus of the existing 2" water supply line from the NWSW and installation of a new 2" water main. Routing of the new water supply line would be similar for both options discussed above.

Operation of the well or wells and associated water treatment will be regulated as a public water supply under Maine Rules Relating to Drinking Water 10-144 Chapter 231 which require among other requirements:

- Demonstration of the technical and financial capacity to manage and operate a public water system including State-licensed operators;
- Maintenance of daily operation records;
- Regular monitoring of raw and treated water quality; and
- Completion of sanitary surveys every five years which is a review/evaluation of eight components of the drinking water system.

If the Town does not have the service of a licensed water operator, the Town or perhaps a tenant/lessee would have to obtain the services of an operator to be in compliance. The

cost of compliance as a public water supply should be factored into lease arrangements with a tenant.

As outlined on Table 3-1, Line Items 1 through 12, we have estimated the cost for use of the existing well. Line 2 is an estimate for submittal of a final approval application describing the proposed use of the existing wells at $5,000; the estimated cost of preparing a letter report relying on historical pumping tests for by others to support permitting. We estimate the annual cost associated with the MeDEP required program of quarterly water quality monitoring to be about $16,000 per year. Adding our recommended monitoring for DRO and metals would increase the annual cost to $18,800.

New Alternate Water Supply Well

We have also studied the potential for permitting, siting, and testing a new water supply well for the case that either the MBD use would require greater water supply, or it is desired to pursue water supply development closer to the MBD portion of the property.

As shown on Figure 3-1, we have identified an area upslope of the upper tank farm area as an area for possible consideration for alternate water supply development closer to the MBD. This area is located upslope of the known petroleum release areas and over 300 feet from the larger areas; and is more than 300 feet away from the MBD and the area shown for possible MBD in-tract subsurface wastewater disposal[1]. The nearest monitoring wells to this area have not indicated the presence of petroleum constituents. Development of a water supply well closer to the MBD would limit the distance for transmission of raw water and would likely allow for location of water treatment units in the MBD development removing the need for a remote water treatment building. This would limit costs associated with upgrading the existing building and perhaps allow for more efficient operations and maintenance of the water supply system local to the point of use.

Figure 3-3 depicts the installation of a new 2” water main via open cut trench excavation from Possible New Alternate Water Supply Well. This work would include installing approximately 700 linear feet of 2” water supply line from the new potential alternate water supply well to the MFMBD with a new water treatment building within the MFMBD. The water line installation would be performed using standard open trench excavation measures, which will require contaminated soils monitoring and testing. The anticipated cost associated with this option is $104,000 (Table 3-1, Lines 29 and 30). It is also possible that the water treatment equipment could be housed within a tenant’s building, which would reduce this cost by approximately $60,000.

As outlined by Table 3-1, Major Category B, Line Items 20 and 22, our opinion of cost for permitting associated with a possible new alternate water supply well is a range of $45,000 to $95,000 through submittal of a final permit approval package. We estimate

[1] *As shown on Figure 3-1, this area for potential water supply development overlaps with topographically high ground that may also be suitable for development of subsurface wastewater disposal. Maine Rules require a 300-foot setback between water supply wells and subsurface wastewater disposal. As such these two potential uses may compete for space in this area.*

the cost through drilling and preliminary testing of a new bedrock water supply well (Lines 14 and 15) at $19,000 that would result in an indication of short term yield/specific capacity and general water quality. In other words, for $19,000 the Town or potential tenant could preliminarily assess the viability of an alternate location for water supply.

Testing of the well in accordance with typical new source permitting standards for a public water supply (Table 3-1, Lines 17 through 19) would add approximately $26,000 assuming that monitoring using existing bedrock wells would be sufficient to support permitting of an alternate well location. Several of the wells that could be useful for this monitoring have been proposed to be decommissioned by DLA (Well OGMW-20 and bedrock wells GZ-7 and GZ-8). Line 16 is a contingency that should additional new bedrock monitoring wells be required to document water quality conditions and/or the drawdown influence near the former release areas. Finally, we have included a 50% contingency for scope uncertainty associated with other possible regulatory requirements.

For either alternative, our opinion of the capital cost for providing the major components for treatment for dissolved metals and petroleum constituents at $13,000 (Table 3-1, Lines 6 and 27) and $7,000 (Table 3-1, Line 7 and 28), respectively. Annual O&M Costs associated with these treatment units and operations monitoring (Adding Lines 3,4,11, and 12), are expected to be on the order of $23,000 per year, including a $2,800 (Table 3-1, Line 4) allowance for what we believe would be discretional water quality monitoring. This estimate does not necessarily include the line items for possible cost associated with services of a licensed water treatment operator and associated regulatory reporting which was beyond the scope of this project and would be somewhat dependant on the discretion of DHHS in final permitting.

Existing Water Storage Tank

Utility Service Co., Inc. of Barnstead New Hampshire performed a visual inspection of the 100,000 gallon elevated water storage tank on December 22, 2011. A detailed summary of their findings is contained in Attachment C. It should be noted that an internal inspection of the tank was not performed due to an unsafe climbing condition associated with the unsecured dome ladder at the top of the tank. While an internal tank inspection was not possible, Utility Services Co. Inc. did complete all other elements of the exterior visual tank inspection. The tank structure was generally found to be in serviceable condition; however, Utility Service Co. Inc. has provided a detailed listing of recommended repairs that are necessary to maintain the tank. The budgetary cost to complete the recommended improvements to the water storage tank is $350,000.

The water storage tank is located on the easterly portion of Mitchell Field, which is more than 3,000 feet from the MFMBD. While the tank may once have provided limited fire protection associated with the former naval base, its primary purpose historically was as a vessel for fresh water supply to the naval buildings and re-supply of tanker ships. It is our opinion that re-activation of the water storage tank for domestic water supply is not necessary. Alternatively, the water storage tank could be used to provide fire protection to the MFMBD; however, the cost to upgrade the tank and annual maintenance of the

tank for fire protection purposes, coupled with the need to likely perform improvements to the water supply line from the tank to the MFMBD, does not justify re-activation of the tank for these purposes. Alternatively, a localized storage tank within the MFMBD designed specifically for the fire protection needs of the tenant would be a more cost effective means for providing water supply for fire protection. Typically underground storage tanks can be installed at a cost of $2/gallon.

For these reasons, the existing water storage tank is not considered useful to the redevelopment within the MFMBD. For the purposes of this study, if no other uses are considered by the Town other than the MFMBD, the demolition and removal of the tank should be considered. The budgetary cost to demolish the tank is $40,000.

3.2 Sanitary Wastewater Disposal

Based on the scenario of use outlined by the Town we have assumed a sanitary wastewater loading of about 1,125 gpd based on 75 persons and 15 gallons per person per day in accordance with Maine Subsurface Wastewater Disposal Rules 10-144 CMR 241 (MSWDR). If the business had shower facilities, a design flow of 20 gpd/person would be appropriate bringing the total flow to about 1,550 gpd. Should the business have water uses that would generate additional volumes of process wastewater or higher strength wastewater, additional design capacity would have to be provided and perhaps additional regulatory requirements for wastewater pre-treatment may be applicable.

If the total wastewater flows exceed 2,000 gpd, additional permitting requirements would be necessary associated with what is referred to as an “engineered system”. These requirements include but are not limited to:

- Greater setback distances to surface water drainages; and
- Additional field testing and engineering calculations to address possible groundwater mounding and nitrogen conditions under the proposed loading.

Allowing for setbacks associated with Shoreland Zone, we believe that on-site subsurface wastewater disposal would likely be developed at the upland portion of the MFMBD within or near the former Tank 2 location as illustrated on Figure 3-1. The former tank farm area is underlain by soil fill and native glacial till soils. Based on the available data, we expect the depth to bedrock to be on the order of 4 feet or greater with groundwater at about 4 to 8 feet below ground. Soil data acquired from the Maine office of GIS indicates the natural soil outside the filled area to be loamy sand or fine sandy loam. The actual soil texture and thickness and depths to seasonal high groundwater would be a focus of additional field work to support permitting.

Assuming that the soil within this filled area would be classified under 10-144 CMR 241 as 2C soil condition or a design class 1 setting with a medium-large disposal field sizing, at 1,125 gpd, a primary disposal area of about 3,700 square feet would be required, or a disposal field bed about 60 feet wide by 60 feet long. Figure 3-1, depicts hypothetical footprints of a primary and replacement field sized according to this assumption. Based

on available bedrock mapping by GZA GeoEnviromental, Inc, this area corresponds to a bedrock trough where the depth to rock may be on the order of 10 to 15 feet. During our field reconnaissance, the surface of this area appeared to be well-drained with little or no evidence of ponded water or wet vegetation that could indicate shallow groundwater conditions.

Should the MFMBD development cover a greater portion of the MFMBD parcel and displace the possible use for wastewater disposal, we believe that other areas of the lower tank farm (T-4 and T-6) upslope to the east may offer similar development potential, perhaps with less thickness of soil and shallow rock conditions that would be subject to a site-specific investigation. As noted under the discussion of water supply alternatives, location of on-site wastewater disposal could encroach on and limit water supply development potential in this area.

As indicated on Figure 3-1, the northeasterly portion of the MFMBD (3-acres +/-) and adjacent meadow area (7-acres +/-) are anticipated to be suitable for onsite subsurface wastewater disposal. All of the area anticipated to be suitable for onsite subsurface wastewater disposal is located in the highest topographic portion of the MFMBD or further upgradient of the MFMBD. As a result, the wastewater from the MFMBD is anticipated to be collected by a small gravity collection system that will convey flows to a centralized pump station at the lowest side of the MFMBD. The pump station will then pump wastewater to the subsurface wastewater disposal fields either in-tract (within the MFMBD) or outside the tract. There appears to be adequate area suitable for either option; however, the final build-out of the MFMBD may dictate the placement of the subsurface wastewater fields outside the MFMBD lease area in order to maximize the developable area for buildings or other structures within the MFMBD.

Cost projections for the construction of both centralized in-tract and outside tract options have been evaluated for providing onsite wastewater disposal for the MFMBD development and are presented in Table 3-2. Projections include soils testing, design, permitting, and construction costs, and are based upon flow rates ranging from 1,125 gpd to 2,000 gpd as summarized below:

1. Figure 3-4 depicts the installation of a centralized pump station with force main to a centralized in-tract subsurface wastewater disposal field:

    a. <u>Option 1 – Flow Rate 1,125 gpd</u>
    This option includes installing the centralized pump station with approximately 750 linear feet of force main pipe to a single subsurface disposal field (3,600 s.f.). The anticipated cost range associated with this option is $162,000 - $177,000.

    b. <u>Option 3 – Flow Rate 2,000 gpd (Engineered System)</u>
    This option is similar in concept to Option 1 above; however, the subsurface disposal area is increased to 6,400 s.f. and split between two disposal field areas. The anticipated cost range associated with this option is $306,000 - $333,000.

2. Figure 5-5 depicts the installation of a centralized pump station with force main to a centralized outside tract subsurface wastewater disposal field:

   a. Option 2 – Flow Rate 1,125 gpd
      This option includes installing the centralized pump station with approximately 1,250 linear feet of force main pipe to a single subsurface disposal field (3,600 s.f.). The anticipated cost associated with this option is $188,000 - $206,000.

   b. Option 4 – Flow Rate 2,000 gpd (Engineered System)
      This option is similar in concept to Option 2 above; however, the subsurface disposal area is increased to 6,400 s.f. and split between two disposal field areas. The anticipated cost associated with this option is $332,000 - 361,000.

The cost summaries provided above do not include any cost for the gravity collection system from the point of discharge associated with the users within the MFMBD to the centralized pump station, or any cost associated with wastewater treatment tanks or wastewater pre-treatment systems.

3.3 Recommendations

The following recommendations are provided with respect to improving the water supply and sanitary wastewater disposal to support development within the MFMBD:

- Water Supply – Option 1: Total Opinion of Cost = $159,000

  Activate existing water supply well, install water treatment building with domestic water supply line via slip-line method.

  Annual Operating and Maintenance Cost = $22,800

- Sanitary Wastewater Disposal – Option 2: Total Opinion of Cost = $206,000

  Based upon the anticipated level of development within the MFMBD and the Town's desire to maximize development potential within the MFMBD, it is recommended that the sanitary wastewater disposal for the MFMBD provided via a centralized outside tract (non-engineered) wastewater disposal system.

While not directly associated with the redevelopment within the MFMBD, if no other potential use other than the MFMBD is considered for the existing water storage building, then it is recommended that the Town plan for the eventual demolition and removal of the existing waste storage tank (estimated cost of $40,000 which includes salvage value of steel tank components).

Table 3-1
Preliminary Opinion of Probable Cost - Water Supply
Preliminary Infrastructure Planning Mitchell Field Marine Business District
Harpswell, Maine

Line Item No.	Description	Estimate of Probable Capital Cost	Nature of Estimate	Basis/Rationale
1	**A. Water Supply Development Option No. 1- Existing New Water Supply Well**			
2	a. DHS New Source Approval Application	$5,000	Top Down Lump Sum	Because the well has not been activated for over three years, as outlined by Maine DEP letter the Town will need to submit an application for activation of the well. We have assumed a letter report outlining background information how the well will be activated and what treatment if any that would be provided.
3	Regulatory Required Groundwater and Raw Water Monitoring	$16,000	Analytical lab unit rates and estimates of time for sampling	Estimated annual cost for MEDEP required quarterly monitoring of MWs 507B, 702 by low flow sampling and NWSW #94688 for VPH, EPH, VOCs (524.2_) including blanks and duplicates. (6 samples total)
4	Recommended Groundwater and Raw Water Quality Monitoring	$2,800	Analytical lab unit rates and estimates of time for sampling	Additional annual lab costs associated with recommended quarterly monitoring for DRO, Arsenic Iron, Manganese.
5	b. Water Treatment and Distribution System Capital Costs	Estimates of probable cost derived for treatment system components including the cost of a new water treatment building or other infrastructure		
6	Dissolved Metals Pre-Treatment	$13,000	Preliminary Vendor Quote	Vendor quote from Air & Water Quality of Freeport Maine (see Attachment E) rounded to the nearest $1,000 for treatment units installed associated with pre-treatment to remove dissolved and particulate iron, manganese for aesthetic concerns and/or to limit potential for fouling of activated carbon. Allowing for up to 20 gpm peak treatment flow.
7	Contingency for Organics Treatment Via Activated Carbon	$7,000	Preliminary Vendor Quote	Vendor quote from Air & Water Quality of Freeport Maine (See Attachment E) rounded to the nearest $1,000 for activated carbon treatment for either taste and odor or regulatory requirements.
8	Treatment Building Infrastructure	$60,000	Preliminary Vendor Quote	Estimated cost to install new 20' by 20' prefabricated building for water quality treatment equipment.
9	Water Distribution Piping			Piping from the point of treatment to the point of use.
9A	Via Open Cut Trench Excavation Method	$226,000	Unit Rates and Estimated Length	Includes 3,600 l.f. of open trench excavation for 2" water line from water treatment building to MFMBD. Provisions for contaminated soils testing included.
9B	Via Slip-Line Method	$74,000	Unit Rates and Estimated Length	Includes 100 l.f. of open trench excavation and 3,500 l.f. of slip-line installation for 2" water line from water treatment building to MFMBD. Provisions for contaminated soils testing included.
10	c., Annual Operations and Maintenance - Water Treatment	Costs associated with monitoring of treatment system components replacement of filter media and other routing O&M. Does not include electric or other utility costs.		
11	Dissolved Metals Pre Treatment	$2,000	Top Down Estimate	Estimated costs for replacement of filter media and sampling and analytical lab testing to support treatment operations. Does not include the cost of a licensed water system operator or other administrative costs.
12	Organics Treatment Via Activated Carbon	$2,000	Top Down Estimate	Estimated costs for replacement of filter media and sampling and analytical lab testing to support treatment operations. Does not include the cost of a licensed water system operator or other administrative costs.

Total Opinion of Capital Cost	$159,000 to $311,000
Total Opinion of Annual Cost	$22,800

Table 3-1
Preliminary Opinion of Probable Cost - Water Supply
Preliminary Infrastructure Planning Mitchell Field Marine Business District
Harpswell, Maine

Line Item No.	Description	Estimate of Probable Capital Cost	Nature of Estimate	Basis/Rationale
13	**B. Water Supply Development Option No. 2- New Water Supply Well Development, Near Tract**			
14	a. Preliminary Application for New Source Approval	$2,000	Top Down Estimate	Preparation of preliminary approval application
15	b. Drilling and Preliminary Testing of New Bedrock Well	$17,000	Top Down Estimate	Based on multiple project experience with reputable Maine water well drilling contractors assuming drilling of a 6-inch diameter air rotary bedrock well completed with 6-inch steel casing grouted into the top of rock and allowing for a total drilling depth of no greater than 600 feet, allowing a contingency for hydraulic fracturing. Assumes drilling at a location less than 100 feet from a hardened road surface with a limited allowance (<$1,000) for site improvements to facilitate drill rig access. Includes a contingency for short-term yield/specific capacity testing and initial analysis of water quality for petroleum.
16	c. Contingency for New Monitoring Wells	$18,000	Top Down Estimate	Allowance for drilling and installation of two to four bedrock monitoring wells to supplement the existing wells as points for monitoring pumping tests and water quality.
17	d. 48-hour Pumping Test	$15,000	Top Down Estimate	Based on multiple project experience in new groundwater source testing of non-transient non-community water supply wells under Maine DEP and DHSS Review. Assuming staffing of the testing by representative of water well contractor, part time staffing and oversight by hydrogeologic consultant, power supplied by a portable generator, not including analytical laboratory costs.
18	e. Analytical Laboratory Costs	$3,000	Top Down Estimate	Project experience in suite of testing required for permitting under DHS permitting for a non-transient non-community water supply under Chapter 231 G,(20) b,i, plus DRO, EPH, VPH and major cations and anions.
19	f. Final Application for New Source Approval	$8,000	Top Down Estimate	Based on Sanborn Head experience in preparation of report summarizing the water well drilling, hydraulic pumping tests and analytical laboratory data assuming that the findings are unremarkable (no substantial contamination)
20	Subtotal New Source Permitting	$63,000		Includes the contingency for new monitoring wells to support pumping tests.
21	g. Contingency for New Source Permitting @50%	$32,000	Contingency for Scope Uncertainty	Contingency for extended pumping test should water levels or pumping rates not stabilize with 48 hours, or if longer testing is required for regulatory permitting. Contingency in the event that Maine DEP or DHHS require more
22	New Source Permitting Including Contingency	$95,000		
23	h. Operations Monitoring			
24	Regulatory Required Groundwater and Raw Water Monitoring	$16,000	Analytical lab unit rates and estimates of time for sampling	Estimated annual cost for MEDEP required quarterly monitoring of MWs 507B, 702 by low flow sampling and NWSW #94688 for VPH, EPH, VOCs (524.2_) including blanks and duplicates and treatment system samples (6 samples total)
25	Recommended Groundwater and Raw Water Quality Monitoring	$2,800	Analytical lab unit rates and estimates of time for sampling	Additional annual lab costs associated with recommended quarterly raw water monitoring for DRO, Arsenic Iron, Manganese.

Table 3-1
Preliminary Opinion of Probable Cost - Water Supply
Preliminary Infrastructure Planning Mitchell Field Marine Business District
Harpswell, Maine

Line Item No.	Description	Estimate of Probable Capital Cost	Nature of Estimate	Basis/Rationale
26	i. Water Treatment System Capital Costs	Estimates of probable cost derived for treatment system components only and does not include the cost of a building or other infrastructure		
27	Dissolved Metals Pre-Treatment	$13,000	Preliminary Vendor Quote	Vendor quote from Air & Water Quality of Freeport Maine (see Attachment E) rounded to the nearest $1,000 for treatment units installed associated with pre-treatment to remove dissolved and particulate iron, manganese for aesthetic concerns and/or to limit potential for fouling of activated carbon. Allowing for up to 20 gpm peak treatment flow.
28	Contingency for Organics Treatment Via Activated Carbon	$7,000	Preliminary Vendor Quote	Vendor quote from Air & Water Quality of Freeport Maine (See Attachment E) rounded to the nearest $1,000 for activated carbon treatment for either taste and odor or regulatory requirements.
29	f. Treatment Building Infrastructure	$60,000	Preliminary Vendor Quote	Estimated cost to install new 20' by 20' prefabricated building for water quality treatment equipment.
30	g. Water Distribution Piping	$44,000	Unit Rates and Estimated Length	Includes 3,600 l.f. of open trench excavation for 2" water line from possible alternate water supply well to water treatment building within the MFMBD. Provisions for contaminated soils testing included.
31	h, Annual Operations and Maintenance - Water Treatment	Costs associated with monitoring of treatment system components replacement of filter media and other routine O&M. Does not include electric or other utility costs.		
32	Dissolved Metals Pre Treatment	$2,000	Top Down Estimate	Estimated costs for replacement of filter media and sampling and analytical lab testing to support treatment operations. Does not include the cost of a licensed water system operator or other administrative costs.
31	Organics Treatment Via Activated Carbon	$2,000	Top Down Estimate	Estimated costs for replacement of filter media and sampling and analytical lab testing to support treatment operations. Does not include the cost of a licensed water system operator or other administrative costs.

Total Opinion of Capital Cost	$169,000 to $219,000
Total Opinion of Annual Cost	$22,800

Notes:
1. This table outlines opinions of probable cost for items related to potential development of a Marine Business District (MBD) at Mitchell Field in Harpswell, Maine.
2. The estimates reflect the team of consultants' professional opinion as to the magnitude of probable cost. As noted in the table, some line items are contingencies that reflect possible scope and cost uncertainty consistent with preliminary estimates. The Town should consider the possibility of adding additional contingency reflecting their risk management preferences. Please refer to the report text and figure for additional supporting information and limitations.

Table 3-2
Preliminary Opinion of Probable Cost - Wastewater Disposal
Preliminary Infrastructure Planning Mitchell Field Marine Business District
Harpswell, Maine

Line Item No.	Description	Estimate of Probable Capital Cost	Nature of Estimate	Basis/Rationale
1	**Wastewater Disposal Option 1 - Centralized In-Tract (Non-Engineered System 1,125 gpd)**			
2	Licensed Site Evaluator Soil Survey	$5,000	Unit Rates and Assumed Duration	Assuming up to two ten hour days with licensed site evaluator and backhoe allowing for observation of test pit explorations to characterize soil conditions as required under Maine Site Location statutes. Allowance for OSHS 1910.120 trained site evaluator and limited assessment of petroleum presence.
3	Disposal Bed Design - Licensed Site Evaluator	$4,000	Top Down Estimate	Licensed site evaluator design of the primary and backup disposal area
4	Central Pump Station and Valve Pit Chamber	$50,000	Top Down Estimate	Wastewater pump to serve a disposal bed at higher elevation from the MBD development.
5	Force Main Piping	$39,000	Unit Rates and Estimated Length	Includes 750 l.f. of open trench excavation for force main from central pump station to disposal field area. Provisions for contaminated soils testing included.
6	Subsurface Wastewater Disposal Field	$64,000	Top Down Estimate	Disposal field area based upon daily flow rate of 1,125 gpd and medium large disposal field system sizing.
7	Contingency	$15,000	Contingency for Scope Uncertainty	

Total Opinion of Cost	$162,000 to $177,000

8	**Wastewater Disposal Option 2 - Centralized Outside Tract (Non-Engineered System 1,125 gpd)**			
9	Licensed Site Evaluator Soil Survey	$5,000	Unit Rates and Assumed Duration	Assuming up to two ten hour days with licensed site evaluator and backhoe allowing for observation of test pit explorations to characterize soil conditions as required under Maine Site Location statutes. Allowance for OSHS 1910.120 trained site evaluator and limited assessment of petroleum presence.
10	Disposal Bed Design - Licensed Site Evaluator	$4,000	Top Down Estimate	Licensed site evaluator design of the primary and backup disposal area
11	Central Pump Station and Valve Pit Chamber	$50,000	Top Down Estimate	Wastewater pump to serve a disposal bed at higher elevation from the MBD development.
12	Force Main Piping	$65,000	Unit Rates and Estimated Length	Includes 750 l.f. of open trench excavation for force main from central pump station to disposal field area. Provisions for contaminated soils testing included.
13	Subsurface Wastewater Disposal Field	$64,000	Top Down Estimate	Disposal field area based upon daily flow rate of 1,125 gpd and medium large disposal field system sizing.
14	Contingency	$18,000	Contingency for Scope Uncertainty	

Total Opinion of Cost	$188,000 to $206,000

Table 3-2
Preliminary Opinion of Probable Cost - Wastewater Disposal
Preliminary Infrastructure Planning Mitchell Field Marine Business District
Harpswell, Maine

Line Item No.	Description	Estimate of Probable Capital Cost	Nature of Estimate	Basis/Rationale
15	**Wastewater Disposal Option 3 - Centralized In-Tract (Engineered System 2,000 gpd)**			
16	Licensed Site Evaluator Soil Survey	$5,000	Unit Rates and Assumed Duration	Assuming up to two ten hour days with licensed site evaluator and backhoe allowing for observation of test pit explorations to characterize soil conditions as required under Maine Site Location statutes. Allowance for OSHS 1910.120 trained site evaluator and limited assessment of petroleum presence.
17	Drilling and Installation of Monitoring Piezometers	$6,000	Top Down Estimate	Based on project experience assuming drilling and installation of up to two days to install monitoring piezometers to document actual depth to water level conditions in the candidate area and to test for background nitrogen concentrations in water. Assume use of a direct push rig and mini-wells.
18	Hydraulic Testing, Water Sampling and Water Quality Characterization	$2,000	Top Down Estimate	One day of field work including hydraulic slug testing and collection of water quality samples for NO2-N analyses
19	Mounding and Nitrate Nitrogen Loading Assessment	$6,000	Top Down Estimate	Assessment of possible groundwater mounding conditions under proposed wastewater loading and assessment of possible nitrate nitrogen conditions a points of downgradient discharge.
20	Civil Design of Engineered Wastewater Disposal System	$10,000	Top Down Estimate	
21	Permit Report Preparation	$8,000	Top Down Estimate	Preparation of report summarizing the wastewater feasibility work formatted for submittal to Maine DEP and DHS.
22	Subtotal Wastewater Feasibility Evaluation Permitting	$37,000		
23	Central Pump Station and Valve Pit Chamber	$50,000	Top Down Estimate	Wastewater pump to serve a disposal bed at higher elevation from the MBD development.
24	Force Main Piping	$39,000	Unit Rates and Estimated Length	Includes 750 l.f. of open trench excavation for force main from central pump station to disposal field area. Provisions for contaminated soils testing included.
25	Subsurface Wastewater Disposal Field	$180,000	Top Down Estimate	Disposal field area based upon daily flow rate of 2,000 gpd and medium large disposal field system sizing.
26	Contingency	$27,000	Contingency for Scope Uncertainty	

Total Opinion of Cost	$306,000 to $333,000

Table 3-2
Preliminary Opinion of Probable Cost - Wastewater Disposal
Preliminary Infrastructure Planning Mitchell Field Marine Business District
Harpswell, Maine

Line Item No.	Description	Estimate of Probable Capital Cost	Nature of Estimate	Basis/Rationale
27	**Wastewater Disposal Option 4 - Centralized Outside Tract (Engineered System 2,000 gpd)**			
28	Licensed Site Evaluator Soil Survey	$5,000	Unit Rates and Assumed Duration	Assuming up to two ten hour days with licensed site evaluator and backhoe allowing for observation of test pit explorations to characterize soil conditions as required under Maine Site Location statutes. Allowance for OSHS 1910.120 trained site evaluator and limited assessment of petroleum presence.
29	Drilling and Installation of Monitoring Piezometers	$6,000	Top Down Estimate	Based on project experience assuming drilling and installation of up to two days to install monitoring piezometers to document actual depth to water level conditions in the candidate area and to test for background nitrogen concentrations in water. Assume use of a direct push rig and mini-wells.
30	Hydraulic Testing, Water Sampling and Water Quality Characterization	$2,000	Top Down Estimate	One day of field work including hydraulic slug testing and collection of water quality samples for NO2-N analyses
31	Mounding and Nitrate Nitrogen Loading Assessment	$6,000	Top Down Estimate	Assessment of possible groundwater mounding conditions under proposed wastewater loading and assessment of possible nitrate nitrogen conditions a points of downgradient discharge.
32	Civil Design of Engineered Wastewater Disposal System	$10,000	Top Down Estimate	
33	Permit Report Preparation	$8,000	Top Down Estimate	Preparation of report summarizing the wastewater feasibility work formatted for submittal to Maine DEP and DHS.
34	Subtotal Wastewater Feasibility Evaluation Permitting	$37,000		
35	Central Pump Station and Valve Pit Chamber	$50,000	Top Down Estimate	Wastewater pump to serve a disposal bed at higher elevation from the MBD development.
36	Force Main Piping	$65,000	Unit Rates and Estimated Length	Includes 750 l.f. of open trench excavation for force main from central pump station to disposal field area. Provisions for contaminated soils testing included.
37	Subsurface Wastewater Disposal Field	$180,000	Top Down Estimate	Disposal field area based upon daily flow rate of 2,000 gpd and medium large disposal field system sizing.
38	Contingency	$29,000	Contingency for Scope Uncertainty	

Total Opinion of Cost	$332,000 to $361,000

Notes:
1. This table outlines opinions of probable cost for items related to potential development of a Marine Business District (MBD) at Mitchell Field in Harpswell, Maine.
2. The estimates reflect the team of consultants' professional opinion as to the magnitude of probable cost. As noted in the table, some line items are contingencies that reflect possible scope and cost uncertainty consistent with preliminary estimates. The Town should consider the possibility of adding additional contingency reflecting their risk management preferences. Please refer to the report text and figure for additional supporting information and limitations.

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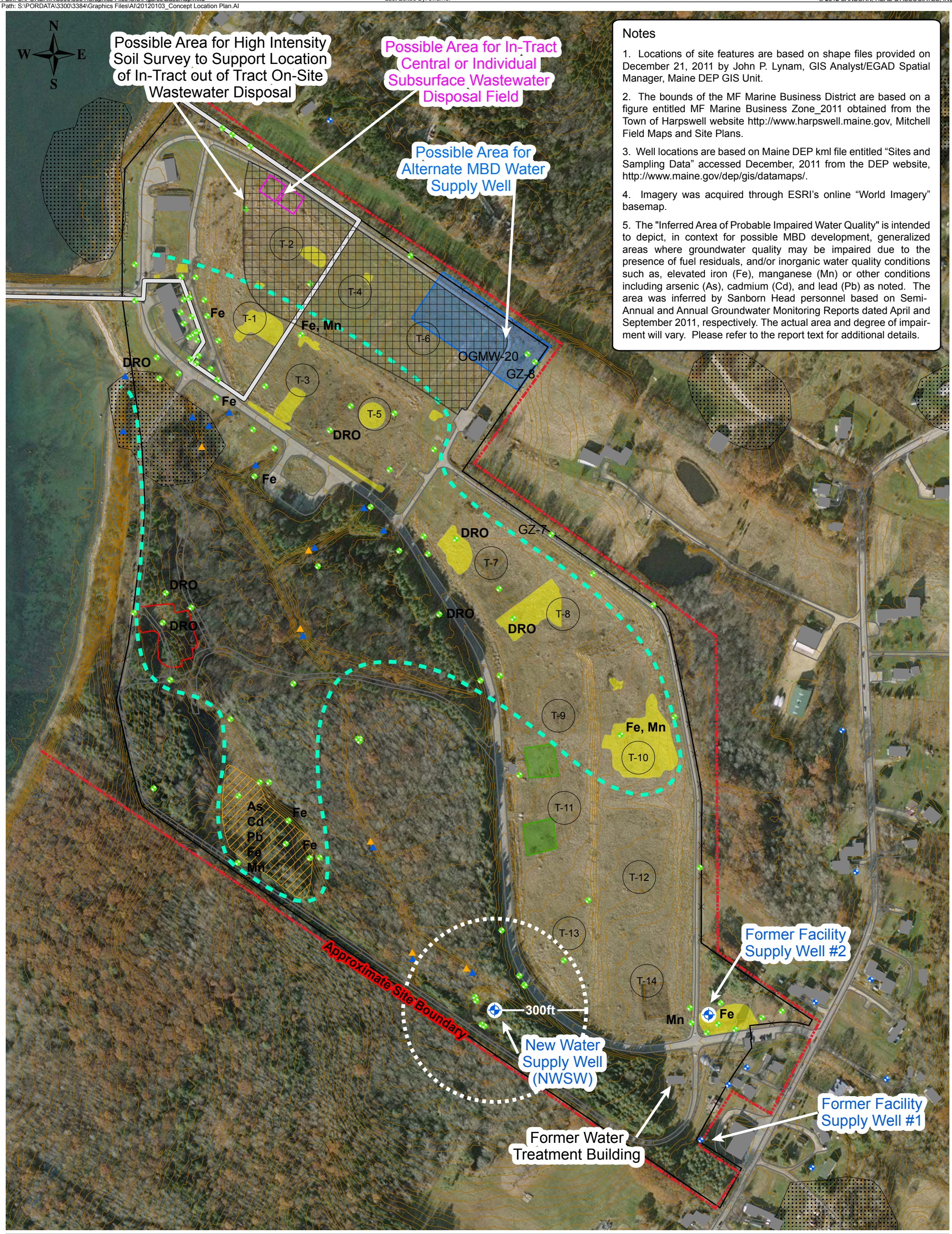


Notes

1. Locations of site features are based on shape files provided on December 21, 2011 by John P. Lynam, GIS Analyst/EGAD Spatial Manager, Maine DEP GIS Unit.

2. The bounds of the MF Marine Business District are based on a figure entitled MF Marine Business Zone_2011 obtained from the Town of Harpswell website http://www.harpswell.maine.gov, Mitchell Field Maps and Site Plans.

3. Well locations are based on Maine DEP kml file entitled "Sites and Sampling Data" accessed December, 2011 from the DEP website, http://www.maine.gov/dep/gis/datamaps/.

4. Imagery was acquired through ESRI's online "World Imagery" basemap.

5. The "Inferred Area of Probable Impaired Water Quality" is intended to depict, in context for possible MBD development, generalized areas where groundwater quality may be impaired due to the presence of fuel residuals, and/or inorganic water quality conditions such as, elevated iron (Fe), manganese (Mn) or other conditions including arsenic (As), cadmium (Cd), and lead (Pb) as noted. The area was inferred by Sanborn Head personnel based on Semi-Annual and Annual Groundwater Monitoring Reports dated April and September 2011, respectively. The actual area and degree of impairment will vary. Please refer to the report text for additional details.

Legend

- Site Water Supply Well
- Domestic Well
- Monitoring Well
- Culvert
- Staff Gauge
- Surface Water Monitoring Location
- Bedrock Outcrop
- Former Drum Storage Area
- Former Landfill
- Community Garden Area
- Limits of Removal Petroleum Containing Soils
- Structure
- 2ft Topographic Contour
- MF Marine Business District
- Inferred Area of Probable Impaired Water Quality (See Note 5)

150 75 0 150 300 Feet

SANBORN HEAD

Figure Narrative

This figure is intended to depict general concepts regarding possible alternatives for on-site water supply and wastewater disposal to serve a possible Marine Business District. It was prepared by Sanborn Head Associates, Inc. as subconsultant to DeLuca-Hoffman & Associates Inc., in joint service to the Town of Harpswell, Maine in preliminary infrastructure planning Please refer to the report text for additional details and limitations.

Figure 3-1
Concept Location Plan

Letter Report
Preliminary Infrastructure Plan and Cost Assessment
Mitchell Field Marine Business District

Town of Harpswell
Harpswell, Maine

Drawn By:	S. Warner
Designed By:	D. Carr
Reviewed By:	DRAFT
Project No:	3384.00
Date:	February 2012

NORTH

GRAPHIC SCALE

0 150 300 600

1 inch = 300 ft.

MITCHELL FIELD
HARPSWELL, MAINE

OPTION 1 - DOMESTIC WATER SUPPLY FROM NWSW TO MFMBD

DeLuca-Hoffman Associates, Inc.
778 MAIN STREET, SUITE 8
SOUTH PORTLAND, ME 04106
207.775.1121
WWW.DELUCAHOFFMAN.COM

DRAWN:	CDD	DATE:	FEB. 2012	FIGURE
DESIGNED:	MTW	SCALE:	1" = 300'	3-2
CHECKED:	JAL	JOB NO.	3059.01	
FILE NAME:	3059-PROPOSED BASE			

NORTH

GRAPHIC SCALE

0 150 300 600

1 inch = 300 ft.

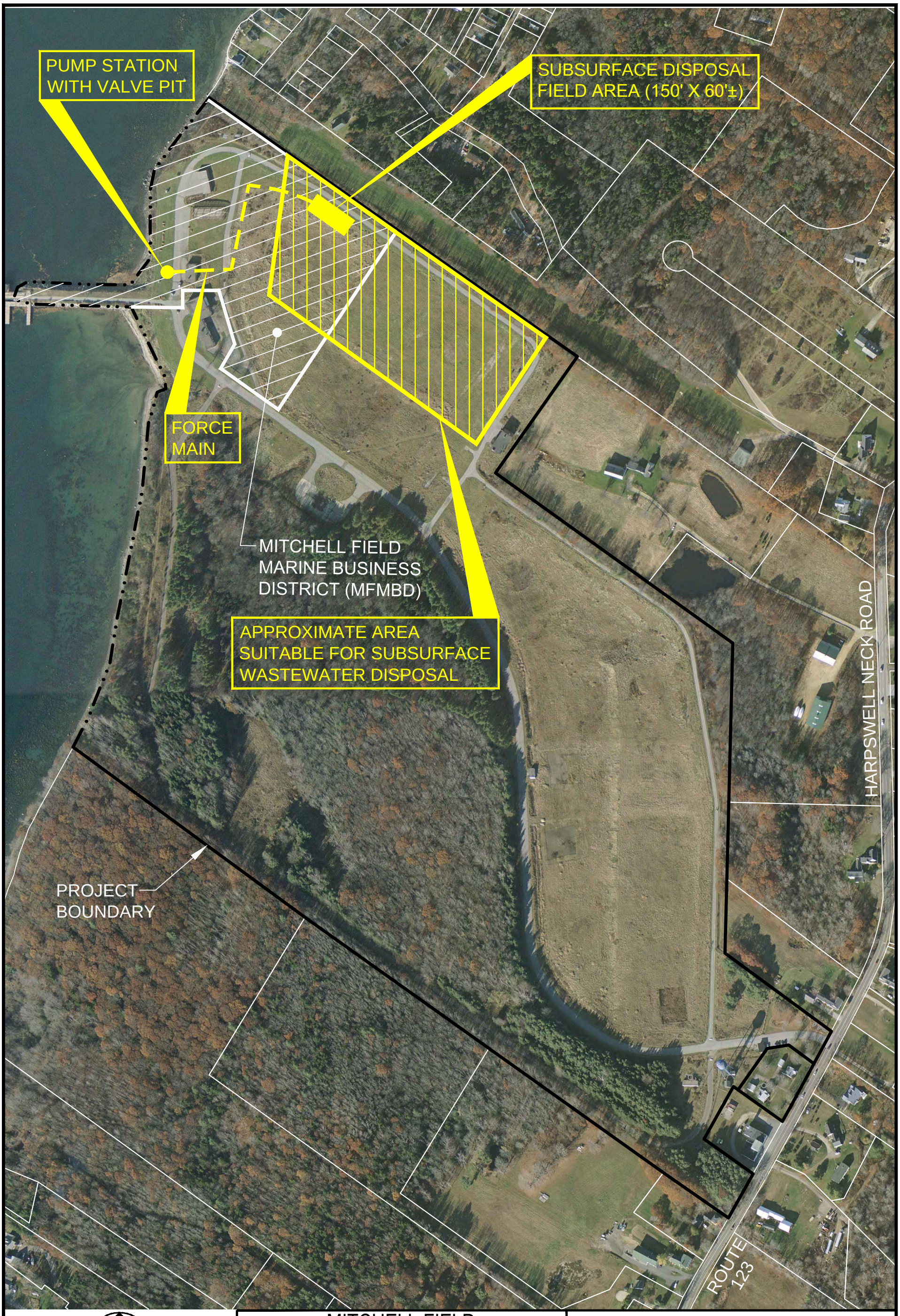
MITCHELL FIELD
HARPSWELL, MAINE

OPTION 2 - DOMESTIC WATER SUPPLY FROM POSSIBLE NEW ALT. WELL TO MFMBD

DeLuca-Hoffman Associates, Inc.
778 MAIN STREET, SUITE 8
SOUTH PORTLAND, ME 04106
207.775.1121
WWW.DELUCAHOFFMAN.COM

DRAWN:	CDD	DATE:	FEB. 2012
DESIGNED:	MTW	SCALE:	1" = 300'
CHECKED:	JAL	JOB NO.	3059.01
FILE NAME:	3059-PROPOSED BASE		

FIGURE 3-3



NORTH

GRAPHIC SCALE

0 150 300 600

1 inch = 300 ft.

MITCHELL FIELD
HARPSWELL, MAINE

OPTION 1 - CENTRAL IN-TRACT SUBSURFACE WASTEWATER DISPOSAL SYSTEM

DH

DeLuca-Hoffman Associates, Inc.
778 MAIN STREET, SUITE 8
SOUTH PORTLAND, ME 04106
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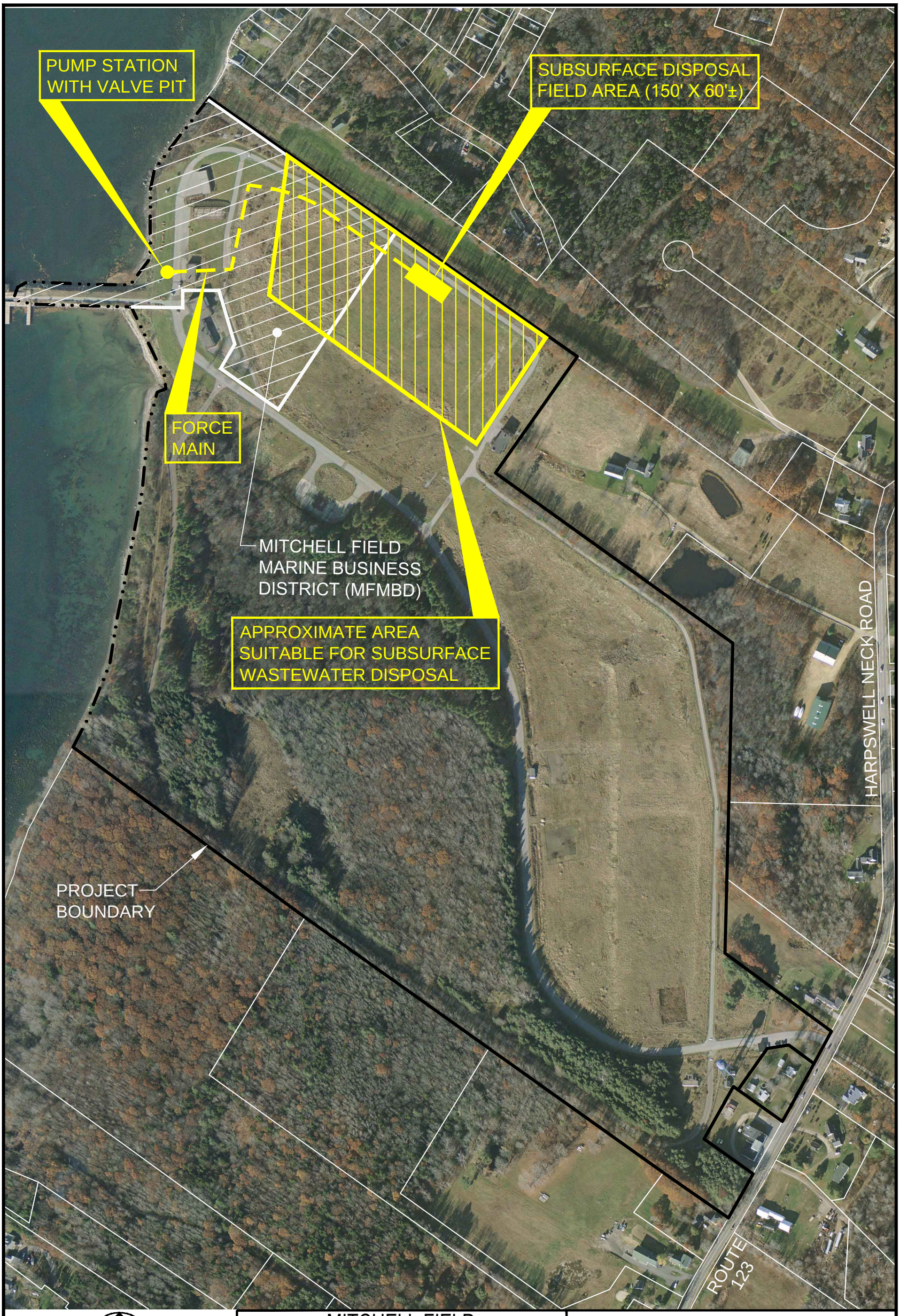
DRAWN:	CDD	DATE:	FEB. 2012	FIGURE
DESIGNED:	MTW	SCALE:	1" = 300'	3-4
CHECKED:	JAL	JOB NO.	3059.01	
FILE NAME:	3059-PROPOSED BASE			



NORTH

GRAPHIC SCALE

0 150 300 600

1 inch = 300 ft.

MITCHELL FIELD
HARPSWELL, MAINE

OPTION 2 - CENTRAL OUTSIDE TRACT
SUBSURFACE WASTEWATER DISPOSAL SYSTEM

DeLuca-Hoffman Associates, Inc.
778 MAIN STREET, SUITE 8
SOUTH PORTLAND, ME 04106
207.775.1121
WWW.DELUCAHOFFMAN.COM

DRAWN:	CDD	DATE:	FEB. 2012
DESIGNED:	MTW	SCALE:	1" = 300'
CHECKED:	JAL	JOB NO.	3059.01
FILE NAME:	3059-PROPOSED BASE		

FIGURE
3-5

SECTION 4

PUBLIC UTILITIES

4.1 Background

During the final stages of the U.S. Government closure of the Harpswell Fuel Depot, the Town sought to have underground franchise utilities extended from Harpswell Neck Road (SR 123) to the MFMBD. It is our understanding that the government commissioned the installation of the underground electrical system; however, the document file suggests that the government declined to install any other underground conduits for other franchise utilities, such as telephone, communications, etc. It is our understanding that the Town retained a separate contractor to complete this work.

No records of the underground utilities have been located within the Town files; however, our office has discussed the electrical installation with the electrical contractor and visited the site on December 6, 2011 to locate the physical improvements, such as transformer pads, junction boxes, etc. Figure 4-1 depicts the approximate location of the underground utilities to support development within the MFMBD as summarized below:

4.2 Underground Electric

As shown on Figure 4-1, the underground electrical system consists of ten junction boxes and three pad-mounted transformers and extends approximately 4,400 linear feet from the primary riser pole feed adjacent to SR 123 to the MFMBD. The underground route generally follows the northerly boundary of the site along the perimeter access road.

Favreau Electric was the electrical contractor that installed the underground system in the late 1990's. Larry Favreau of Favreau Electric was contacted earlier this fall to discuss the underground electrical installation. During those discussions, he indicated that the underground system consists of two 5" diameter conduits that provide three phase electrical service to the MFMBD. Currently, the existing buildings within the MFMBD are served by 120/208 volt electrical service; however, 480 volt three-phase electrical service is readily available. This would require replacement of the electrical transformer that serves the building; however, no other upgrades or improvements to the underground electrical system would be required.

4.3 Underground Telephone\Communications

Favreau Electric did not install the underground conduits for telephone, communications, etc.; however, Larry Favreau did indicate that a separate contractor did install underground conduits for telephone, etc. which generally followed the underground electrical system. The locations of the communications pull-boxes and approximate route of the underground communications conduits are also shown on Figure 4-1. Visual inspection of the communication pull-box within the MFMBD indicates that the underground conduit system consists of two 4" diameter and two 2" diameter conduits

with pull strings for future installation of communications cables for telephone, etc. Individual conduits stubs were also observed extending towards the individual buildings within the MFMBD; however, it is unknown the extent of these service stub conduits.

In discussions with the franchise utilities, a budgetary cost of $8,000 should be anticipated to extend telephone and cable communication conductors within the underground conduit system from Harpswell Neck Road to the MFMBD.

4.4 Recommendations

The franchise utilities would typically install conductors at the request of a development for service. As such, the type of conductors (copper versus fiber, etc.) is determined based upon the specific needs of the development. It is not recommended to pursue the installation of any communication conductors until such time as a specific tenant is determined for the MFMBD.

NORTH

GRAPHIC SCALE

0 150 300 600

1 inch = 300 ft.

MITCHELL FIELD
HARPSWELL, MAINE

EXISTING UGE & COMMUNICATIONS CONDUIT ROUTING

DeLuca-Hoffman Associates, Inc.
778 MAIN STREET, SUITE 8
SOUTH PORTLAND, ME 04106
207.775.1121
WWW.DELUCAHOFFMAN.COM

DRAWN:	CDD	DATE:	MAY 2012	FIGURE
DESIGNED:	MTW	SCALE:	1" = 300'	4-1
CHECKED:	JAL	JOB NO.	3059.01	
FILE NAME:	3059-PROPOSED BASE			

R:\3059-Town of Harpswell\Cadd\Concept Set\dwg\3059-PROPOSED BASE.dwg, FIG 4-1 EXISTING UGE & COMM, 5/3/2012 11:09:15 AM, cdube

SECTION 5

TOPOGRAPHY & GEOTECHNICAL ISSUES

5.1 Topography

The MFMBD contains approximately 11 acres of land on the northwesterly corner of the overall project site, which abuts the tidal waters of Middle Bay. In general, the topography across the MFMBD slopes in an east to west direction.

The lower portion of the MFMBD contains several of the former naval buildings and associated paved surfaces located along the primary access road connecting to the Jetty-Pier structure. This portion of the MFMBD contains approximately 4 acres with topography ranging from elevation 18 to 28.

The upper portion of the MFMBD contains approximately 7 acres of meadow land that was associated with the former fuel tank storage dike containment areas. This topography across this portion of the MFMBD ranges from elevation 28 to 48.

At this point, there is no known tenant for the MFMBD; therefore, a specific site development plan is not available. As discussed during a meeting with Town officials on November 10, 2011, a grading plan has been prepared for the MFMBD based upon the following approach:

- Creation of relatively level pad area(s) with slopes ranging from 2% to 3% that are anticipated to be suitable for general site development within the MFMBD.

- Based upon the existing topography it is likely that development within the MFMBD will result in two tiers of level pad areas separated by a fill embankment slope.

Based upon this development approach, a conceptual grading plan was prepared using the SiteOps software program, which optimizes the cost of the earthworks based upon the grading constraints provided. Figure 5-1 depicts the results of the optimized grading plan, which is anticipated to cost approximately $345,000, which includes $90,000 for contaminated soils monitoring and testing.

5.2 Geotechnical Issues

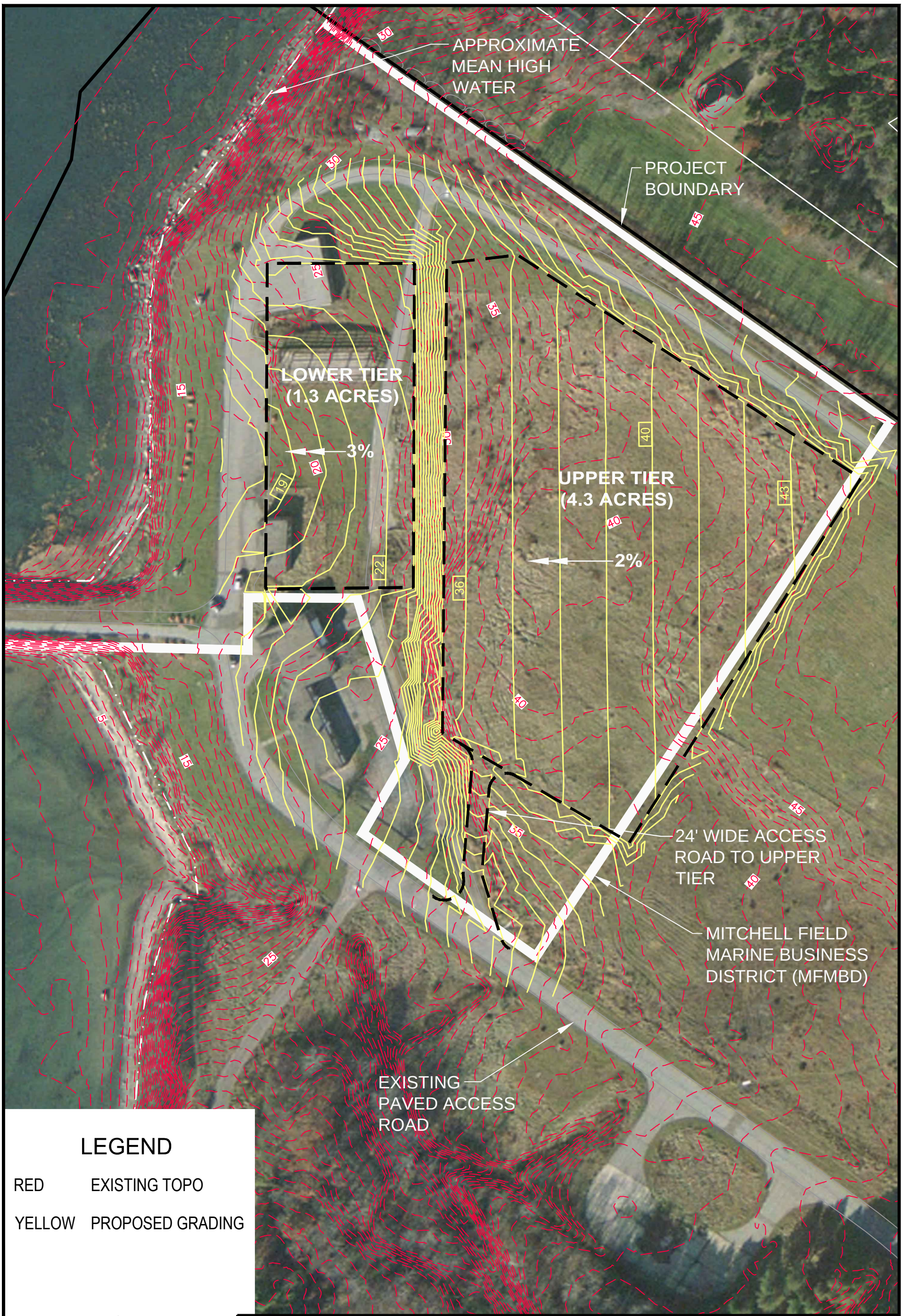
Based on available mapping by others, the MFMBD area is underlain by soil fill and what has been mapped as brown to grey glacial till overlain by soil fill. The area was the subject of test pit excavations and other historical field explorations related to investigations of petroleum contamination although the logs were not available at MeDEP. Perhaps the logs could be obtained directly from GZA GeoEnvironmental, Inc.

The bedrock surface contour mapping available in MeDEP files indicate that the depth to bedrock in this area likely ranges from about 2 feet to nearly 20 feet. Bedrock may be found less than a foot below ground in the vicinity of the existing buildings within the MFMBD. Within and near the former tank farm, the texture and density of soil fill is expected to vary.

Future geotechnical explorations and testing to support the MFMBD would be focused on assessing the thickness of soil, the depth to rock, and the potential bearing capacity of native and fill soils. Although we understand that the historical explorations and testing conducted in the MFMBD did not indicate the gross presence of petroleum outside of the immediate vicinity of T-1 and T-2, depending on the actual proposed footprint for buildings and utilities, the geotechnical explorations should be coordinated with a program of environmental soils testing intended to address the deed restriction on excavation discussed in Section 1 of this report.

5.3 Recommendations

The topographic and geotechnical issues discussed above are presented for informational purposes only and should be viewed as conceptual in nature with respect to the potential development within the MFMBD. There are no topographic or geotechnical infrastructure improvements recommended for implementation by the Town to support development within the MFMBD. The scope of this work is specific to the actual tenant needs and as such the cost associated with site grading, earthmoving and geotechnical issues are customarily a part of the tenant site development cost.



MITCHELL FIELD
HARPSWELL, MAINE

CONCEPTUAL GRADING PLAN
WITHIN MFMBD

DeLuca-Hoffman Associates, Inc.
778 MAIN STREET, SUITE 8
SOUTH PORTLAND, ME 04106
207.775.1121
WWW.DELUCAHOFFMAN.COM

DRAWN:	CDD	DATE:	FEB. 2012	FIGURE
DESIGNED:	MTW	SCALE:	1" = 100'	5-1
CHECKED:	JAL	JOB NO.	3059.01	
FILE NAME:	3059-PROPOSED BASE			

SECTION 6

STORMWATER MANAGEMENT

6.1 Background

Existing stormwater management infrastructure on the Mitchell Field site includes a series of open ditches and storm drains that convey runoff directly to the Atlantic Ocean.

Soil disturbance of one acre or more will trigger the requirement for a Stormwater Law Permit from the Maine Department of Environmental Protection (MeDEP), and the creation of three acres of new impervious surface will trigger the requirement for a Site Location of Development Permit. Site Law projects are typically required to meet Chapter 500 Standards for stormwater peak discharge rate, stormwater quality, and erosion and sedimentation control. However, the standard for peak discharge rate is likely not applicable to development in the Mitchell Field Marine Business District (MFMBD) because runoff from this area is directly tributary to the Atlantic Ocean.

The stormwater treatment standard (Ch. 500 General Standard) requires that a project's stormwater management system include treatment measures that will mitigate for the increased frequency and duration of channel erosive flows due to runoff from smaller storms, provide for effective treatment of pollutants in stormwater, and mitigate potential temperature impacts. This must be achieved by using one or more [approved best management practices] to control runoff from no less than 95% of the impervious area and no less than 80% of the developed area that is impervious or landscaped.

Under Site Law, MeDEP will require stormwater runoff from redeveloped impervious areas to meet the General Standard to the extent practicable. If the 95% standard can not be met for redeveloped areas, the Department will determine the extent of treatment that is practicable for the existing impervious area within the MFMBD.

The MFMBD is approximately 11 acres in size, including the area above mean high water and the jetty-pier. To assess the stormwater management needs for the MFMBD, we have assumed that the zone will be developed in accordance with the two-tier conceptual grading plan presented in Section 5 of this report. This concept includes two tiers of development, totaling 5.6 acres. For estimating purposes, we have assumed that these areas will be fully developed with impervious area.

6.2 Discussion

The majority of the existing development in the MFMBD, including the three existing buildings, is located within 300' of the ocean. The ground elevation in this area is approximately 18 at the base of the jetty-pier and climbs to approximately 26 at the northern building. The area available for stormwater management BMPs is limited by

the location and elevation of existing development as well as the uncertain nature and extent of future development.

Approved methods of stormwater treatment include wetponds, filters, infiltration, and buffers. The use of stormwater buffers within the MFMBD is likely not feasible because the area has been entirely developed, and the use of buffers in the existing wooded areas of the Mitchell Field site are not possible because of existing elevations.

Infiltration of stormwater on the site is an undesirable option due to the historical soil contamination as well as other unknown site constraints, such as localized soil permeability and groundwater depth.

We have concentrated our efforts on studying the potential use of wetponds and filters to meet Chapter 500 Standards. We have explored the potential for locating BMPs both within and outside the MFMBD. We have also studied the scenarios of using several localized BMPs throughout the development (Low Impact Development) as well as fewer centralized BMPs that may be shared across the MBD.

Three options are presented below for complying with MDEP standards for stormwater management. The options have been organized from least expensive to most expensive based on the cost estimates and experience.

- <u>Option 1 – Dispersed Underdrained Filter Basins</u>

  One option for treating runoff from the MBD is to construct several, localized underdrained filter basins throughout the site. Filter basins are designed to capture and retain stormwater runoff from smaller, more frequent rain events and filter it through a soil media prior to discharge. This method of treating stormwater runoff close to its source is considered beneficial by restoring natural hydrology through greater groundwater recharge and evapotranspiration than large, end of pipe systems.

  The MeDEP design standards limit the size of underdrained soil filter basins to 3,000 s.f. (filter area). A filter basin of this size will treat approximately 1.38 acres of impervious area. A benefit of using this method for stormwater treatment is that filter basins have relatively small footprints and can be sited almost anywhere throughout the site. Additionally, soil filter basins are relatively shallow structures when compared to alternative BMPs. As such, it is less likely that expensive bedrock removal would be required to construct soil filters.

  Because the nature and extent of development within the MBD is uncertain, we have estimated the cost required to treat each acre impervious development. This per-acre cost is approximately $15,000, including an estimated cost of $1,100 associated with soil testing in accordance with an approved Soil Testing & Management Plan. For 5.6 acres of impervious development within the MFMBD, the cost to treat runoff using this method is estimated to be $84,000.

- Option 2 – Shared Wetpond

  If a single BMP were to serve the entire MFMBD, it would need to be sited at a lower elevation than the majority of the developed area. For the Mitchell Field site, this limits potential locations to the eastern side of the existing access road, directly adjacent to the shore.

  Because stormwater filters are typically designed to treat runoff from areas smaller than one acre, a wetpond is the best option to treat large tributary areas in a single BMP. In order to meet MeDEP design criteria, a wetpond's permanent pool must hold a volume equal to 1.5 inches times the tributary impervious area plus 0.6 inches times the tributary landscaped area. Because the MFMBD is directly tributary to the Atlantic Ocean, additional stormwater storage for channel protection would not be required. In order to treat the 5.6 acres of impervious area included in the conceptual grading plan presented in Section 5, a wetpond's permanent pool volume would need to be at least 1.13 ac-ft., as calculated below:

  (1.5" x 5.6 acres) + (0.6" x 0.0 acres) = 0.70 ac-ft. (30,492 cf)

  Assuming a pond depth of 5', the surface area of a wetpond serving the entire MBD would be approximately 9,000 s.f. It appears that the only potential location for a wet pond of this size is outside the MBD, between the access road and the shore, south of the jetty-pier (shown on Figure 6-1). This outside tract location would require removal of the existing subsurface wastewater disposal field. The area adjacent to the shore north of the jetty-pier was not considered because of the existing electrical transformers located in this vicinity (see Section 4 of this report).

  Based on our experience, we estimate that a single wetpond, sized to treat 5.6 acres of impervious area within the MFMBD, would cost between $100,000 and $150,000. This includes an estimated cost of $5,500 associated with soil testing in accordance with an approved Soil Testing & Management Plan. The construction cost will be highly dependent on the amount of ledge removal necessary. While it is expected that bedrock would be encountered in the construction of a wetpond in the location shown, the depth of existing bedrock is unknown.

  If a tenant were to occupy only a portion of the MFMBD, a wetpond, sized proportionally, could be constructed in this location with provisions for expansion at a later date.

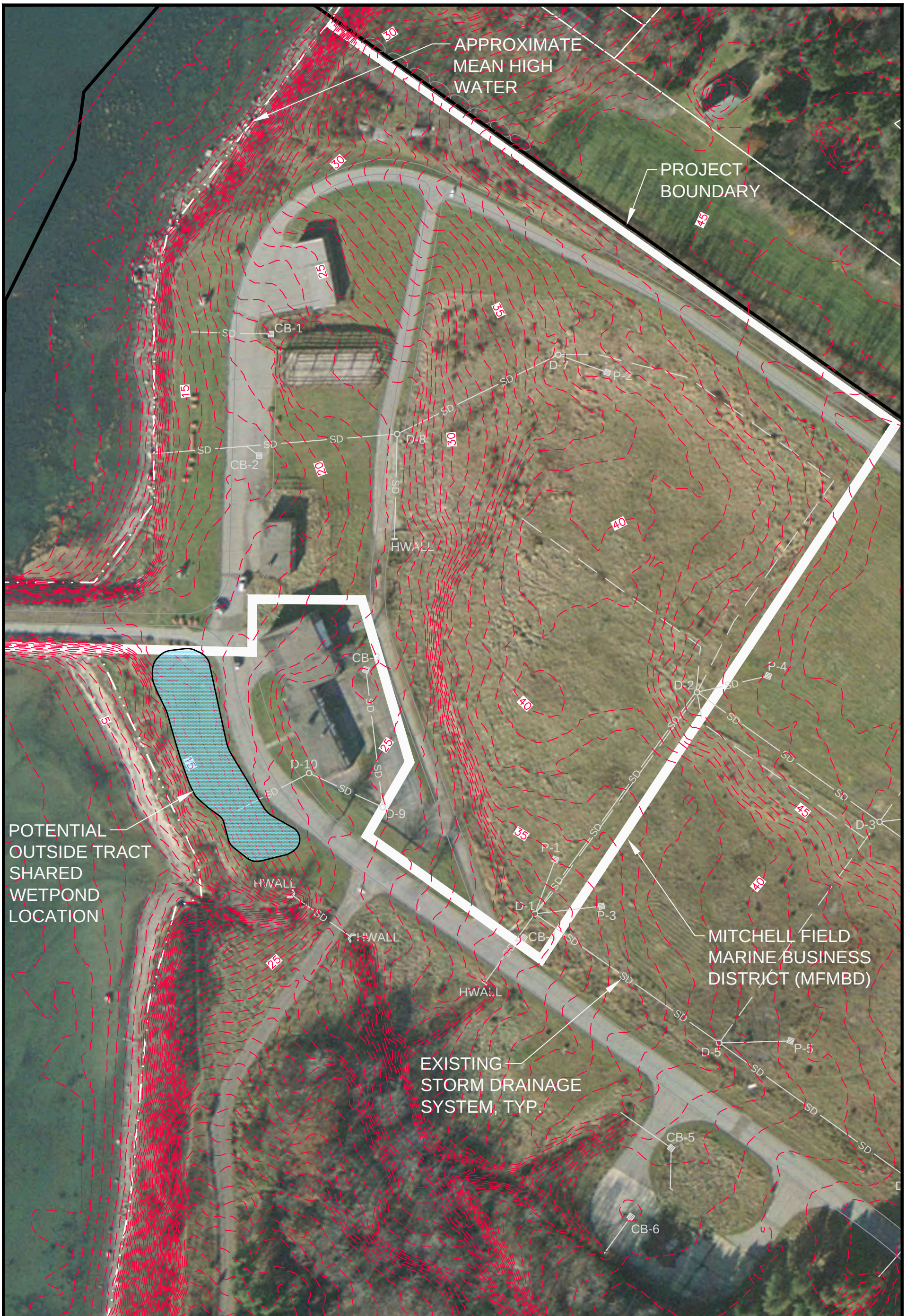
- Option 3 – Proprietary Stormwater Treatment Systems

  A third option is to treat runoff in one or more underground, proprietary stormwater treatment systems. MeDEP has approved the use of several systems, such as Filterra/Stormtech, Stormtreat, and StormFilter. The design of proprietary stormwater management systems is highly flexible depending on the system and the nature of development; however, in our experience, these systems are consistently

more expensive than surface BMPs such as wetponds and soil filters, and are only cost effective if a surface BMP can not be located effectively on the site, such as in urban environments.

6.3 Recommendations

The stormwater management issues and methods for providing water quality treatment discussed above are presented for informational purposes only and should be viewed as conceptual in nature with respect to the potential development within the MFMBD. The stormwater management plan and approach for meeting the water quality treatment needs of the development should be designed around the specific needs and development plan of the tenant. As such, the costs associated with providing stormwater management are customarily a part of the tenant site development cost.



NORTH

GRAPHIC SCALE

0 50 100 200

1 inch = 100 ft.

MITCHELL FIELD
HARPSWELL, MAINE

STORMWATER MANAGEMENT
OPTION 1 - SHARED WETPOND

DeLuca-Hoffman Associates, Inc.
778 MAIN STREET, SUITE 8
SOUTH PORTLAND, ME 04106
207.775.1121
WWW.DELUCAHOFFMAN.COM

DRAWN:	CDD	DATE:	FEB. 2012	FIGURE
DESIGNED:	MTW	SCALE:	1" = 100'	6-1
CHECKED:	JAL	JOB NO.	3059.01	
FILE NAME:	3059-PROPOSED BASE			

SECTION 7

PIER

TEC Associates of South Portland, Maine performed a visual inspection of the pier structure on January 19, 2012. The inspection was performed by Wayne Duffett, P.E. during a full tide cycle (from high to low) to visually observe the pipe piles and sheet piling beneath the pier structure. A detailed summary of the findings is contained in Attachment D.

TEC Associates has provided limited recommendations for repairs necessary for potential future use of the pier; however, the pier support structure (pipe piles and sheet piling) was observed to be in very poor condition. Immediate closure of the pier to all uses, including foot traffic, is recommended. Fencing should be improved to prevent unauthorized access and inspected regularly.

Significant renovations/replacement of the piles and steel sheeting will be required if the Town elects to refurbish the facility to its original intent for large ship anchorage. Alternatively, if the Town elects to use the facility for a less intensive use, such as passive recreational access for fishermen, etc., then the level of structural improvements to support the pier could be reduced. If recreational access is intended, then additional safety measures, such as railing, should be installed around the perimeter of the pier facility and any known hazards associated with the former pipe supports and abandoned piping and pumping systems, including pumping and control buildings, should be removed.

Additionally, TEC Associates finds that at the current rate of deterioration, the pipe pile supported portion of the pier has an unquantifiable life span before it falls from dead weight, and consideration should be given to repairing the pier as a lesser cost than potential removal costs associated with failure.

TEC Associates was retained to perform visual inspection of the pier condition and provide an assessment of its general condition and potential issues associated with continued use; however, their scope did not include detailed structural investigation nor detailed assessment of costs associated with any repairs, etc. TEC Associates has provided budgetary opinions of cost associated with the following three approaches in planning future pier work:

1.	Complete removal of the pier	$2,000,000
2.	Removal of two dolphins, gangways and restoration of pier for passive recreational use	$1,700,000
3.	Complete restoration of pier for large ship anchorage	$6,900,000

As stated above, based upon the current rate of deterioration and poor condition of the pier, TEC Associates has recommended the immediate closure of the pier to any and all uses. As a result, the Town should implement immediate measures to extend fencing, signage, etc. to prevent unauthorized access to the pier. The budgetary cost to implement additional security fencing, etc. is $10,000.

SECTION 8

CONCEPTUAL PHYSICAL PLAN

8.1 Background

The Preliminary Infrastructure Assessment to support future development within the Mitchell Field Marine Business District is summarized within the proceeding sections of this report. The following is a summary of the recommendations, opinions of cost, implementation timeline and suggested responsible party.

8.2 Recommended Infrastructure Improvements by Town:

Recommendation	Opinion of Cost	Timeline
Preparation of Soil Testing and Management Plan	$20,000	2012-2013
Site Entrance Access Improvements	$3,550	2012-2013
Interior Access Road Improvements:		
- Limited Repairs	$5,000	2012
- Partial Reconstruction	$296,950	TBD (2015 est.)
Water Supply – Option 1:		
- Activate existing well and install distribution line with water treatment system	$159,000	Prior to development within MFMBD
- Annual operation and maintenance of water treatment system	$22,800	Annual
Pier:		
- Install security fence and signage associated with immediate closure of Pier	$10,000	ASAP 2012
- Remove and demolish Pier or stabilize Pier for passive recreational use	$2,000,000	TBD

8.3 Recommended Infrastructure Improvements by MFMBD Development:

Recommendation	Budgetary Opinion of Cost
Sanitary Wastewater Disposal – Option 2	$206,000
Installation of Communication Conductors	$8,000
Site Grading	$345,000
Stormwater Management	$84,000

ATTACHMENT A-1

Quitclaim Deed
Dated October 21, 2001

QUITCLAIM DEED

THIS INDENTURE, made this **22nd** day of **October, 2001**, between the UNITED STATES OF AMERICA, acting by and through the Commanding Officer, Engineering Field Activity Northeast, Naval Facilities Engineering Command, Lester, Pennsylvania, hereinafter referred to as the GOVERNMENT, and the TOWN OF HARPSWELL, MAINE, a municipal corporation existing under the laws of the State of Maine and located in the County of Cumberland, State of Maine, hereinafter referred to as the GRANTEE.

WHEREAS, the GOVERNMENT has determined that certain property known as the Defense Fuel Support Point, Casco Bay, Harpswell, Maine consisting of a total of approximately 118.5 acres of land, more or less, together with improvements, and certain related personal property thereon, hereinafter referred to as the PROPERTY, are not needed for a public purpose; and

WHEREAS, United States Public Law 103-337 §2839, as amended by United States Public Law 106-398 §2852, hereinafter referred to as Public Law, provides the Secretary of the Navy the authority to convey PROPERTY to the GRANTEE pursuant to certain conditions, restrictions and limitations contained in the Public Law.

WITNESSETH: That the GOVERNMENT in accordance with the Public Law does, subject to any easements and encumbrances of record and subject to the reservations, exceptions, notices, covenants, conditions and restrictions expressly contained herein, remise, release and quitclaim unto the GRANTEE, its successors and assigns, to have and to hold forever, except as specifically required by Title 42, United States Code at Section 9620(h)(3)(B) and as provided herein, without any warranty express or implied, all right, title and interest to the underlying estate, buildings, structures, improvements and related personal property situated thereon, which the GOVERNMENT has in and to the PROPERTY, consisting of 118.5 acres of land, more or less, and more fully described in the legal description attached hereto as Exhibit "A" and made a part hereof.

NOTICES, COVENANTS, CONDITIONS, RESERVATIONS AND RESTRICTIONS

1. **Notice of Environmental Condition:** Information concerning the environmental condition of PROPERTY is contained in the document known as Facility Remediation Closure Report, Defense Fuel Support Point, Casco Bay, South Harpswell, Maine dated February 2000; the Finding of Suitability to Transfer (FOST) dated 16 June 2000, and Addendum to Finding of Suitability to Transfer (FOST Addendum) dated 03 October 2001, which are incorporated by reference and made a part hereof as if set out in length, and the receipt of which are hereby acknowledged by the GRANTEE.

2. **Covenant required by Title 42, United States Code at Section 9620(h)(3)(A):** In accordance with the requirements and limitations contained in *Title 42, United States Code at Section 9620(h)(3)(A)(ii)*, the GOVERNMENT hereby warrants that –

(a) all remedial action necessary to protect human health and the environment with respect to any hazardous substances remaining on PROPERTY has been taken, and

(b) any additional remedial action found to be necessary after delivery of this Quitclaim Deed, not the result of actions conducted by future occupants of the property, shall be conducted by the GOVERNMENT.

3. **Reservation of Access required by Title 42, United States Code at Section 9620(h)(3)(A):** In accordance with the requirements and limitations contained in *Title 42, United States Code at Section 9620(h)(3)(A)(iii)* the GOVERNMENT expressly reserves for itself and for the Maine Department of Environmental Protection (MEDEP) all reasonable and appropriate rights of access to the PROPERTY described herein when remedial action or corrective action is found to be necessary after delivery of this Quitclaim Deed. The right of access described herein shall include the right to conduct tests, investigations and surveys, including, where necessary, drilling, testpitting, boring and other similar activities. Such right shall also include the right to conduct, operate, maintain or undertake any other response or remedial action as required or necessary including, but not limited to, monitoring wells, pumping wells and treatment facilities. GRANTEE agrees to comply with activities of the GOVERNMENT in furtherance of these covenants and will take no action to interfere with future necessary remedial and investigative actions of the GOVERNMENT. Any such entry, including such activities, responses or remedial actions, shall be coordinated with the GRANTEE or its successors and assigns, and shall be performed in a manner which minimizes (a) any damage to any structures on PROPERTY and (b) any disruption or disturbance of the use and enjoyment of PROPERTY.

4. **Notices and Restrictions on Use Pursuant to CERCLA 120(h)(3)(A):** In accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), Section 120(h)(3)(A), notice is required where hazardous substances were known to have been released, disposed of, or stored for one year or more. Pursuant to this requirement, the GRANTEE, its successors and assigns, are hereby notified that said FOST Addendum provides notice as to the type of hazardous substances that were stored on the PROPERTY and also those substances where releases had occurred but it was determined that no remedial action was required.

5. **Restrictive Covenants:** The following restrictive covenants shall run with the parcel and shall be perpetually binding upon the GRANTEE, its successors and assigns, and shall inure to the benefit of and be enforceable by the MEDEP and the GOVERNMENT:

a. **Covenant and Restriction Regarding Residential Use:** The GRANTEE covenants and agrees, on behalf of itself, its successors and assigns, that any use of the PROPERTY for residential purposes shall be prohibited without the prior written approval of MEDEP.

b. **Covenant and Restriction Regarding Use of Groundwater:** The GRANTEE covenants and agrees, on behalf of itself, its successors and assigns, that any drilling of wells on the PROPERTY and any use of the groundwater beneath the PROPERTY without the prior written approval of the MEDEP shall be prohibited provided, however, that the Town may continue to operate the existing water supply well located on the PROPERTY in such a manner that the use of this well will not exceed 450 gallons per day, without specific written approval of MEDEP; provided, however, that any such approved additional use does not cause the GOVERNMENT to incur any additional liability or responsibility of any kind, in law or equity, that may result in any way from the draw or use of the groundwater from existing wells beneath the property.

c. **Covenant and Restriction Regarding Subsurface Excavation:** The GRANTEE covenants and agrees, on behalf of itself, its successors and assigns, that any subsurface excavation, digging, drilling, exploration or construction on the parcel shall be prohibited without the prior written approval of the MEDEP.

6. **Lead Based Paint and Asbestos Covenant:** The GRANTEE covenants and agrees, on behalf of itself, its successors and assigns, that it will comply with all applicable Federal, state and local laws relating to asbestos and lead-based paint in its use and occupancy of the property (including demolition and disposal of existing structures). Section 101-47.304-13 of the Federal Property Management Regulations, attached hereto as Exhibit "B" and made a part hereof, contains complete warnings and responsibilities relating to asbestos-laden materials.

7. **FAA Construction:** The GRANTEE covenants and agrees, on behalf of itself, its successors and assigns, that all construction, alterations, or improvements on PROPERTY, of whatever type or nature, are subject to the formal advance approval of the Federal Aviation Administration (FAA) for compliance with the regulations set forth in *14 CFR Part 77,* entitled "Objects Affecting Navigable Airspace," and issued under the authority of the Federal Aviation Act of 1958, as amended.

8. **Non-Discrimination:** The GRANTEE covenants and agrees, on behalf of itself, its successors and assigns and every successor in interest to PROPERTY hereby conveyed, or any part thereof, that the said GRANTEE and such heirs, successors, and assigns shall not discriminate upon the basis of race, age, color, sex, religion, or national origin in the use, occupancy, sale or lease of PROPERTY described herein, or in their employment practices conducted thereon. This covenant shall not apply, however, to the lease or rental of a room or rooms within a family dwelling unit; nor shall it apply with respect to religion to premises used primarily for religious purposes. The GOVERNMENT shall be deemed a beneficiary of this covenant without regard to whether it remains the owner of any land or interest therein in the locality of PROPERTY hereby conveyed and shall have the sole right to enforce this covenant in any court of competent jurisdiction.

9. **AS IS, WHERE IS:** Except as expressly provided for in this Quitclaim Deed, or as a matter of law, PROPERTY described herein is conveyed "AS IS and WHERE IS" without representation, warranty or guaranty as to quality, quantity, character, condition, size or kind, or that the same is in a condition, or fit, to be used for the purpose for which intended.

IN WITNESS WHEREOF, I, Gregory C. Preston acting pursuant to my authority as Real Estate Contracting Officer, on behalf of the United States of America, have hereunto executed this Quitclaim Deed the day and year first written above.

UNITED STATES OF AMERICA

By: Gregory C. Preston

GREGORY C. PRESTON
Realty Officer, Product Line Coordinator
Real Estate Contracting Officer

WITNESS:
Stephanie D. Zanowski

GOVERNMENT ACKNOWLEDGEMENT

STATE OF PENNSYLVANIA)
) ss.
COUNTY OF DELAWARE)

I, the undersigned, a Notary Public in and for the State of Pennsylvania, do hereby certify that this day personally appeared before me in the state and county aforesaid, Gregory C. Preston, Real Estate Contracting Officer, Engineering Field Activity Northeast, Naval Facilities Engineering Command, Lester, Pennsylvania, for and on behalf of the UNITED STATES OF AMERICA, whose name is signed to the foregoing document and acknowledged the same to be his free act and deed in such official capacity.

Given under my hand and seal this 22nd day of October, 2001.

Notary Public

(Seal)

My Commission Expires _____

NOTARIAL SEAL
MICHAEL T. DUNN, Notary Public
Lester, Delaware County
My Commission Expires Nov. 6, 2004

SEAL

EXHIBIT "A"
LEGAL DESCRIPTION

A certain lot or parcel of land with improvements thereon, located on the west side of Harpswell Neck Road (State Route 123), in the Town of Harpswell, Cumberland County, State of Maine, and more particularly described as follows:

Beginning at an iron rod set on the west side of Harpswell Neck Road at the northeast corner of land now or formerly Joseph E. and Dorothy F. Lemay (Cumberland County Registry of Deeds (CCRD) Book 1752, Page 368);

Thence N 55°-56'-30" W along land of said Lemay 257.83 feet to a point;

Thence N 55°-18'-00" W along land now or formerly David R. Sparks (CCRD Book 7661, Page 242), 1469.33 feet to an iron rod set;

Thence N 54°-29'-30" W along land now or formerly Elizabeth Bradley Childs et al (CCRD Book 8450, Page 325), 916.78 feet to an iron rod set;

Thence continuing N 54°-29'-30" W along land of said Childs et al, approximately 257 feet to the low water line of Middle Bay;

Thence northerly along the low water line of Middle Bay approximately 2630 feet to a point in the southwesterly line of land now or formerly John Lloyd Thompson (CCRD Book 3809, Page 307);

Thence S 55°-38'-30" E along land of said Thompson, approximately 230 feet to an iron rod set; said iron rod set being N 11°-04'-19" E of and 2207.82 feet from the previously mentioned iron rod set;

Thence continuing S 55°-38'-30" E along land of said Thompson, 1457.67 feet to a drill hole found; -

Thence S 34°-21'-30" W along land now or formerly Dain H. Allen (CCRD Book 4660, Page 258), 472.92 feet to an iron rod set;

Thence S 55°-07'-30" E along land of said Allen, 971.21 feet to an iron rod set;

Thence S 00°-41'-30" W along land of said Allen and land now or formerly Ruth N. Gill (CCRD Book 7409, Page 131) and land now or formerly William R. and Gertrude L. Knight (CCRD Book 1967, Page 286), 1031.42 feet to an iron rod set;

Thence S 54°-28'-00" E along land of said Knight, 439.43 feet to an iron rod set on the west side of Harpswell Neck Road;

Thence S 27°-42'-00" W along said Harpswell Neck Road, 121.98 feet to a point;

Thence N 54°-28'-00" W along land to be retained by the grantor herein, 104.28 feet to a point;

Thence S 80°-23'-39" W along land to be retained by the grantor herein, 72.60 feet to a point;

Thence S 34°-19'-47" W along land to be retained by the grantor herein, 168.30 feet to a point in the northeast line of land now or formerly Harpswell Neck Fire Department Association (CCRD Book 1973, Page 333);

Thence N 55°-23'-30" W along land of said Harpswell Neck Fire Department Association, 19.02 feet to an iron rod set;

Thence S 28°-27'-00" W along land of said Harpswell Neck Fire Department Association, 200.00 feet to an iron rod set;

Thence S 55°-23'-30" E along land of said Harpswell Neck Fire Department Association, 200.00 feet to an iron rod set on the west side of Harpswell Neck Road;

Thence S 28°-27'-00" W along said Harpswell Neck Road, 168.11 feet to the point of beginning.

Said parcel contains 118.5 acres, more or less.

Meaning and intending to describe and convey, and hereby conveying, a portion of the property taken by the United States of America in the Judgment on the Declaration of Taking, dated October 9, 1952, recorded in Cumberland County Registry of Deeds in Book 2111, Page 426, including all right, title and interest to the low water line of Middle Bay appurtenant to the shore.

All bearings appear to be relative to True North and are based upon the Judgment Deed to the United States of America (CCRD Book 2111, Page 426). All iron rods set are ¾ inch diameter rebar with surveyor's identification caps. Reference is made to the survey plan entitled "Standard Boundary Survey, Casco Bay Fuel Farm, Route 123, Harpswell, Maine," prepared for the Town of Harpswell by Harty & Harty Professional Land Surveyors, revision 2 dated August 20, 2001 to be recorded herewith at said Registry.

EXHIBIT "B"

CODE OF FEDERAL REGULATIONS
TITLE 41--PUBLIC CONTRACTS AND PROPERTY MANAGEMENT
SUBTITLE C--FEDERAL PROPERTY MANAGEMENT REGULATIONS SYSTEM
CHAPTER 101--FEDERAL PROPERTY MANAGEMENT REGULATIONS
SUBCHAPTER H--UTILIZATION AND DISPOSAL
PART 101-47--UTILIZATION AND DISPOSAL OF REAL PROPERTY
SUBPART 101-47.3--SURPLUS REAL PROPERTY DISPOSAL
§ 101-47.304 ADVERTISED AND NEGOTIATED DISPOSALS.

§ 101-47.304-13 Provisions relating to asbestos.

Where the existence of asbestos on the property has been brought to the attention of the disposal agency by the Standard Form 118 information provided in accordance with §101-47.202-2(b)(9), the disposal agency shall incorporate such information (less any cost or time estimates to remove the asbestos- containing materials) in any Invitation for Bids/Offers to Purchase and include the following:

Notice of the Presence of Asbestos--Warning!

(a) The Purchaser is warned that the property offered for sale contains asbestos-containing materials. Unprotected or unregulated exposures to asbestos in product manufacturing, shipyard, and building construction workplaces have been associated with asbestos-related diseases. Both the Occupational Safety and Health Administration (OSHA) and the Environmental Protection Agency (EPA) regulate asbestos because of the potential hazards associated with exposure to airborne asbestos fibers. Both OSHA and EPA have determined that such exposure increases the risk of asbestos-related diseases, which include certain cancers and which can result in disability or death.

(b) Bidders (Offerors) are invited, urged and cautioned to inspect the property to be sold prior to submitting a bid (offer). More particularly, bidders (offerors) are invited, urged and cautioned to inspect the property as to its asbestos content and condition and any hazardous or environmental conditions relating thereto. The disposal agency will assist bidders (offerors) in obtaining any authorization(s) which may be required in order to carry out any such inspection(s). Bidders (Offerors) shall be deemed to have relied solely on their own judgment in assessing the overall condition of all or any portion of the property including, without limitation, any asbestos hazards or concerns.

(c) No warranties either express or implied are given with regard to the condition of the property including, without limitation, whether the property does or does not contain asbestos or is or is not safe for a particular purpose. The failure of any bidder (offeror) to inspect, or to be fully informed as to the condition of all or any portion of the property offered, will not constitute grounds for any claim or demand for adjustment or withdrawal of a bid or offer after its opening or tender.

(d) The description of the property set forth in the Invitation for Bids (Offer to Purchase) and any other information provided therein with respect to said property is based on the best information available to the disposal agency and is believed to be correct, but an error or omission, including but not limited to the omission of any information available to the agency having custody over the property and/or any other Federal agency, shall not constitute grounds or reason for nonperformance of the contract of sale, or any claim by the Purchaser against the Government including, without limitation, any claim for allowance, refund, or deduction from the purchase price.

(e) The Government assumes no liability for damages for personal injury, illness, disability or death, to the Purchaser, or to the Purchaser's successors, assigns, employees, invitees, or any other person subject to Purchaser's control or direction, or to any other person, including members of the general public, arising from or incident to the purchase, transportation, removal, handling, use, disposition, or other activity causing or leading to contact of any kind whatsoever with asbestos on the property which is the subject of this sale, whether the Purchaser, its successors or assigns has or have properly warned or failed properly to warn the individual(s) injured.

(f) The Purchaser further agrees that in its use and occupancy of the property it will comply with all Federal, state, and local laws relating to asbestos.

[53 FR 29894, Aug. 9, 1988]

RECEIVED
RECORDED REGISTRY OF DEEDS
2001 OCT 23 PM 1:46
CUMBERLAND COUNTY
John B O'Brien

ATTACHMENT A-2

Quitclaim Deed
Dated September 14, 2005

Navy Contract No.
N62472-05-RP-10084

QUITCLAIM DEED

THIS INDENTURE, made this **14th** day of **September**, **2005**, between the UNITED STATES OF AMERICA, acting by and through the Commanding Officer, Engineering Field Activity Northeast, Naval Facilities Engineering Command, Lester, Pennsylvania, hereinafter referred to as the GOVERNMENT, and the TOWN OF HARPSWELL, MAINE, a municipal corporation existing under the laws of the State of Maine and located in the County of Cumberland, State of Maine, hereinafter referred to as the GRANTEE.

WHEREAS, the GOVERNMENT determined that certain property known as the Defense Fuel Support Point, Casco Bay, Harpswell, Maine consisting of approximately 119.32 acres were not needed for a public purpose and so conveyed all except 0.82 acres of the same to the GRANTEE by deed dated October 22, 2001 and recorded in the Cumberland County Registry of Deeds in Book 16872, Pages 236-243; and

WHEREAS, the GOVERNMENT has now determined that the aforementioned remaining 0.82 acres, together with the improvements thereon, hereinafter referred to as the PROPERTY, is no longer needed for a public purpose;

WHEREAS, United States Public Law 103-337 §2839, as amended by United States Public Law 106-398 §2852, hereinafter referred to as Public Law, provides the Secretary of the Navy the authority to convey the PROPERTY to the GRANTEE pursuant to certain conditions, restrictions and limitations contained in the Public Law.

WITNESSETH: That the GOVERNMENT in accordance with the Public Law does, subject to any easements and encumbrances of record and subject to the reservations, exceptions, notices, covenants, conditions and restrictions expressly contained herein, remise, release and quitclaim unto the GRANTEE, its successors and assigns, to have and to hold forever, except as specifically required by Title 42, United States Code at Section 9620(h)(4)(D) and as provided herein, without any warranty express or implied, all right, title and interest to the underlying estate, buildings, structures, improvements and related personal property situated thereon, which the GOVERNMENT has in and to the PROPERTY, consisting of a total of 0.82 acres of land, more or less, and more fully described in the legal description attached hereto as Exhibit "A" and made a part hereof.

Meaning and intending to convey, and hereby conveying a total of 0.82 acres of land, more or less.

NOTICES, COVENANTS, CONDITIONS, RESERVATIONS AND RESTRICTIONS

1. **Reservation of Easement for Sampling Potable Water Wells**: The GOVERNMENT expressly reserves for itself its successors and assigns an easement and right of way for the purpose of ingress and egress for such pedestrian, and vehicular traffic as is reasonably necessary to ensure convenient access over, across and through the PROPERTY, for the GOVERNMENT to perform periodic sampling of existing potable water wells located on the PROPERTY and more fully described in the description attached hereto as Exhibit "B" and made a part hereof, as necessary as part of the Department of Defense's ongoing Long Term Monitoring Program at the former Defense Fuel Support Point, Casco Bay. GOVERNMENT shall offer to provide, whenever practicable before each sampling event, written notice to the GRANTEE.

2. **Notice of Environmental Condition:** Information concerning the environmental condition of the PROPERTY is contained in the document known as Environmental Baseline Survey (EBS) Naval Family Housing at Harpswell, Maine dated February 2000, Supplemental Environmental Baseline Survey (EBS) Naval Family Housing at Harpswell, Maine dated December 2004, and the Finding of Suitability to Transfer (FOST) dated 03 February 2005, which are incorporated by reference and made a part hereof as if set out in length, and the receipt of which are hereby acknowledged by the GRANTEE.

3. **Covenant required by Title 42, United States Code at Section 9620(h)(4)(D):** In accordance with the requirements and limitations contained in *Title 42, United States Code at Section 9620(h)(4)(D)(i)*, the GOVERNMENT hereby warrants that –

   (a) any remedial action found to be necessary after delivery of this Quitclaim Deed, not the result of actions conducted by future occupants of the property, shall be conducted by the GOVERNMENT.

4. **Reservation of Access required by Title 42, United States Code at Section 9620(h)(4)(D):** In accordance with the requirements and limitations contained in *Title 42, United States Code at Section 9620(h)(4)(D)(ii)* the GOVERNMENT expressly reserves for itself and for the Maine Department of Environmental Protection (MEDEP) all reasonable and appropriate rights of access to the PROPERTY described herein when remedial action or corrective action is found to be necessary after delivery of this Quitclaim Deed. The right of access described herein shall include the right to conduct tests, investigations and surveys, including, where necessary, drilling, test-pitting, borings and other similar activities. Such right shall also include the right to conduct, operate, maintain or undertake any other response or remedial action as required or necessary including, but not limited to, monitoring wells, pumping wells and treatment facilities. GRANTEE agrees to comply with activities of the GOVERNMENT in furtherance of these covenants and will take no action to interfere with future necessary remedial and investigative actions of the GOVERNMENT. Any such entry, including such activities, responses or remedial actions,

shall be coordinated with the GRANTEE or its successors and assigns, and shall be performed in a manner which minimizes (a) any damage to any structures on the PROPERTY and (b) any disruption or disturbance of the use and enjoyment of the PROPERTY.

5. **Lead–Based Paint:** The GRANTEE covenants and agrees, on behalf of itself, its successors and assigns, that it will comply with all Federal, State, and local laws relating to lead-based paint in its use and occupancy of PROPERTY (including demolition and disposal of existing improvements). The GRANTEE shall hold harmless and indemnify the GOVERNMENT from and against any and all loss, judgment, claims, demands, expenses, or damages of whatever nature or kind which might arise or be made against the GOVERNMENT as a result of lead-based paint having been present on PROPERTY herein described. Improvements on the PROPERTY were constructed prior to 1978 and, as with all such improvements, a lead-based paint hazard may be present.

In addition, the GRANTEE on behalf of itself, its successors and assigns hereby acknowledges the following notice as required by 40 CFR §745.113 as follows:

"Every purchaser of any interest in residential real property on which a residential dwelling was built prior to 1978 is notified that such property may present exposure to lead from lead-based paint that may place young children at risk of developing lead poisoning. Lead poisoning in young children may produce permanent neurological damage, including learning disabilities, reduced intelligence quotient, behavioral problems, and impaired memory. Lead poisoning also poses a particular risk to pregnant women. The seller of any interest in residential real property is required to provide the buyer with any information on lead-based paint hazards from risk assessments or inspections in the seller's possession and notify the buyer of any known lead-based paint hazards. A risk assessment or inspection for possible lead-based paint hazards is recommended prior to purchase."

6. **Presence of Asbestos:** The GRANTEE, its successors and assigns, are hereby warned and do acknowledge that certain portions of the improvements on PROPERTY subject to this Quitclaim Deed contain asbestos-laden materials. The GRANTEE, by acceptance of this Quitclaim Deed, covenants and agrees, for itself, its successors and assigns, that in its use and occupancy of PROPERTY (including demolition and disposal of existing improvements) it will comply with all Federal, State and local laws relating to asbestos and that the GOVERNMENT assumes no liability for damages for personal injury, illness, disability or death to the GRANTEE, or to GRANTEE's successors, assigns, employees, invitees, or any other person, including members of the general public, arising from or incident to the purchase, transportation, removal, handling, use, disposition, or other activity causing or leading to contact of any kind whatsoever with asbestos on PROPERTY, whether the GRANTEE, its successors or assigns, has properly warned or failed to properly warn the individual(s) injured. Section 102-75.335 of the Federal Management Regulations, attached hereto as Exhibit "C" and made a part hereof, contains complete warnings and responsibilities relating to asbestos-laden materials.

7. **Covenant and Restriction on Water Supply Wells:** The GRANTEE, its successors and assigns are hereby on notice that as identified in the aforementioned FOST, previous sampling of the groundwater revealed contamination by volatile organic compounds or coliform. Water treatment systems were installed in the housing units to remove the contaminants. After the units were vacated, the treatment systems were deactivated and removed. The GOVERNMENT assumes no continued responsibility for the aforementioned water treatment systems. GRANTEE covenants and agrees, on behalf of itself, its successors and assigns, that prior to allowing groundwater to be drawn from the water supply wells to be used or made available for human consumption, that GRANTEE shall ensure that there is no unacceptable risk to human health, and if necessary, will install an appropriate necessary water treatment system.

8. **FAA Construction:** The GRANTEE covenants and agrees, on behalf of itself, its successors and assigns, that all construction, alterations, or improvements on the PROPERTY, of whatever type or nature, are subject to the formal advance approval of the Federal Aviation Administration (FAA) for compliance with the regulations set forth in *14 CFR Part 77,* entitled "Objects Affecting Navigable Airspace," and issued under the authority of the Federal Aviation Act of 1958, as amended.

9. **Non-Discrimination:** The GRANTEE covenants and agrees, on behalf of itself, its successors and assigns and every successor in interest to the PROPERTY hereby conveyed, or any part thereof, that the said GRANTEE and such successors, and assigns shall not discriminate upon the basis of race, age, color, sex, religion, or national origin in the use, occupancy, sale or lease of the PROPERTY described herein, or in their employment practices conducted thereon. This covenant shall not apply, however, to the lease or rental of a room or rooms within a family dwelling unit; nor shall it apply with respect to religion to premises used primarily for religious purposes. The GOVERNMENT shall be deemed a beneficiary of this covenant without regard to whether it remains the owner of any land or interest therein in the locality of the PROPERTY hereby conveyed and shall have the sole right to enforce this covenant in any court of competent jurisdiction.

10. **AS IS, WHERE IS:** Except as expressly provided for in this Quitclaim Deed, or as a matter of law, the PROPERTY described herein is conveyed "AS IS and WHERE IS" without representation, warranty or guaranty as to quality, quantity, character, condition, size or kind, or that the same is in a condition, or fit, to be used for the purpose for which intended.

IN WITNESS WHEREOF, I, Stephanie D. Zamorski, acting pursuant to my authority as Real Estate Contracting Officer, on behalf of the United States of America, have hereunto executed this Quitclaim Deed the day and year first written above.

UNITED STATES OF AMERICA

By: Stephanie D Zamorski
STEPHANIE D. ZAMORSKI
Special Assistant for Real Estate
Real Estate Contracting Officer

WITNESS:
Richard J. Howard
Richard J. Howard.

GOVERNMENT ACKNOWLEDGEMENT

STATE OF MAINE)
COUNTY OF CUMBERLAND, ss.)

I, the undersigned, a Notary Public in and for the State of Maine, do hereby certify that this day personally appeared before me in the state and county aforesaid, Stephanie D. Zamorski, Real Estate Contracting Officer, Engineering Field Activity Northeast, Naval Facilities Engineering Command, Lester, Pennsylvania, for and on behalf of the UNITED STATES OF AMERICA, whose name is signed to the foregoing document and acknowledged the same to be her free act and deed in such official capacity.

Given under my hand and seal this 14Th day of September, 2005.

Brenda Cook
Notary Public

SEAL

My Commission Expires 12-1-08

Brenda Cook, Notary Public
State of Maine
My Commission Expires 12/1/2008

EXHIBIT "A"
LEGAL DESCRIPTION

A certain lot or parcel of land with improvements thereon, located on the west side of Harpswell Neck Road (State Route 123), in the Town of Harpswell, Cumberland County, State of Maine, and more particularly described as follows:

Beginning at an iron rod set on the west side of Harpswell Neck Road at the northeast corner of land now or formerly of the Harpswell Neck Fire Department Association, Inc. as evidenced by a deed dated September 14, 1949 and recorded at the Cumberland County Registry of Deeds (CCRD) in Book 1973, Page 333;

Thence N 55° 23' 30" W by and along land of said Harpswell Neck Fire Department Association, Inc. 180.98 feet to a chain link fence;

Thence N 34° 19' 47" E by and along land now or formerly of the Town of Harpswell as evidenced by a deed dated October 22, 2001 and recorded at the Cumberland County Registry of Deeds in Book 16872, Page 236, 168.30 feet to a point;

Thence N 80° 23' 39" E by and along land of said Town of Harpswell 72.60 feet to a point;

Thence S 54° 28' 00" E by and along land of said Town of Harpswell 104.28 feet to a point on the west side of Harpswell Neck Road;

Thence S 27° 42' 00" W by and along Harpswell Neck Road 156.04 feet to an iron rod set;

Thence S 28° 27' 00" W by and along Harpswell Neck Road, 62.70 feet to the point of beginning.

Said parcel contains .82 acres, more or less.

Meaning and intending to describe and convey, and hereby conveying, a portion of the property taken by the United States of America in the Judgment on the Declaration of Taking, dated October 9, 1952, recorded at the Cumberland County Registry of Deeds in Book 2111, Page 426.

All bearings appear to be relative to True North and are based upon the Judgment Deed to the United States of America (CCRD Book 2111, Page 426). All iron rods set are ¾ inch diameter rebar with surveyor's identification caps. Reference is made to the survey plan entitled "Standard Boundary Survey, Casco Bay Fuel Farm, Route 123, Harpswell, Maine," prepared for the Town of Harpswell by Harty & Harty Professional Land Surveyors, revision 2 dated August 20, 2001 and recorded at said Registry in Plan Book 201, Page 440.

EXHIBIT "B"
DESCRIPTION

Beginning at a point in the southwest corner of the Casco Bay Housing Area parcel, thence and with said housing parcel's westerly property line N 34 19' 47" E an approximate distance of 12' to a point, thence turning easterly at a right angle an approximate distance of 9' to the approximate center of the first potable water well, thence returning to the same 12' point in the westerly property line and continuing N 34 19' 47" E an approximate distance of 92' to a point, thence turning easterly at a right angle an approximate distance of 25' to the approximate center of the second potable water well.

EXHIBIT "C"

CODE OF FEDERAL REGULATIONS
TITLE 41 – PUBLIC CONTRACTS AND PROPERTY MANAGEMENT
SUBTITLE C – FEDERAL PROPERTY MANAGEMENT REGULATIONS SYSTEM
CHAPTER 102 – FEDERAL MANAGEMENT REGULATION
PART 102-75 – REAL PROPERTY DISPOSAL

§ 102-75.335 Provisions relating to asbestos.

Where the existence of asbestos on the property has been brought to the attention of the disposal agency by the Report of Excess Real Property (Standard Form 118) information provided (see §102-75.125), the disposal agency must incorporate this information (less any cost or time estimates to remove the asbestos-containing materials) into any offer to purchase and conveyance document and include the following wording:

Notice of the Presence of Asbestos – Warning!

(a) The Purchaser is warned that the property offered for sale contains asbestos-containing materials. Unprotected or unregulated exposures to asbestos in product manufacturing, shipyard, and building construction workplaces have been associated with asbestos-related diseases. Both the Occupational Safety and Health Administration (OSHA) and the Environmental Protection Agency (EPA) regulate asbestos because of the potential hazards associated with exposure to airborne asbestos fibers. Both OSHA and EPA have determined that such exposure increases the risk of asbestos-related diseases, which include certain cancers and which can result in disability or death.

(b) Bidders (Offerors) are invited, urged and cautioned to inspect the property to be sold prior to submitting a bid (offer). More particularly, bidders (offerors) are invited, urged and cautioned to inspect the property as to its asbestos content and condition and any hazardous or environmental conditions relating thereto. The disposal agency will assist bidders (offerors) in obtaining any authorization(s) which may be required in order to carry out any such inspection(s). Bidders (Offerors) shall be deemed to have relied solely on their own judgment in assessing the overall condition of all or any portion of the property including, without limitation, any asbestos hazards or concerns.

(c) No warranties either express or implied are given with regard to the condition of the property including, without limitation, whether the property does or does not contain asbestos or is or is not safe for a particular purpose. The failure of any bidder (offeror) to inspect, or to be fully informed as to the condition of all or any portion of the property offered, will not constitute grounds for any claim or demand for adjustment or withdrawal of a bid or offer after its opening or tender.

(d) The description of the property set forth in the Invitation for Bids (Offer to Purchase) and any other information provided therein with respect to said property is based on the best information available to the disposal agency and is believed to be correct, but an error or

omission, including but not limited to the omission of any information available to the agency having custody over the property and/or any other Federal agency, shall not constitute grounds or reason for nonperformance of the contract of sale, or any claim by the Purchaser against the Government including, without limitation, any claim for allowance, refund, or deduction from the purchase price.

(e) The Government assumes no liability for damages for personal injury, illness, disability or death, to the Purchaser, or to the Purchaser's successors, assigns, employees, invitees, or any other person subject to Purchaser's control or direction, or to any other person, including members of the general public, arising from or incident to the purchase, transportation, removal, handling, use, disposition, or other activity causing or leading to contact of any kind whatsoever with asbestos on the property which is the subject of this sale, whether the Purchaser, its successors or assigns has or have properly warned or failed properly to warn the individual(s) injured.

(f) The Purchaser further agrees that in its use and occupancy of the property it will comply with all Federal, State, and local laws relating to asbestos.

Received
Recorded Register of Deeds
Sep 16,2005 11:13:39A
Cumberland County
John B OBrien

ATTACHMENT A-3

Letter from MeDEP dated September 15, 2008
Regarding Supply Well at Mitchell Field

file

STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

JOHN ELIAS BALDACCI
GOVERNOR

DAVID P. LITTELL
COMMISSIONER

RECEIVED
SEP 17 2008
Town of Harpswell

September 15, 2008

Ms. Kristi Eiane
Town of Harpswell
PO Box 39
Harpswell, ME 04079

RE: Supply well at Mitchell Field

Dear Ms. Eiane:

The Maine Department of Environmental Protection (MEDEP) previously imposed a pumping rate restriction on the supply well in the former Defense Fuel Farm (Mitchell Field) of 450 gallons per day (GPD). This pumping rate restriction was recorded in the quitclaim deed when the Navy transferred the property to the Town of Harpswell in October 2001. This pumping rate was based, in part, on the Town's desire to utilize the site for recreational purposes only.

In November 2006, with a grant from the Brownfield fund, the MEDEP contracted with Woodard and Curran (W&C) to develop a numerical groundwater model (MODFLOW) to evaluate potential impacts of overburden groundwater contamination to the bedrock aquifer. The modeling results demonstrated that:

- no contamination would be predicted to be drawn into the supply well at a pumping rate of 6.25 gallons per minute (GPM) and
- contamination could be drawn into the supply well at a rate of 12.5 GPM.

In May 2007 W&C, on behalf of the MEDEP, supervised the installation of two bedrock monitoring wells to determine whether bedrock groundwater contamination exists in the southern portion of the former above ground storage tank farm. Details of the test can be found in an Internal Memorandum to Jean Firth from Hank Andolsek, dated July 10, 2007. Analytical tests for diesel range organics (DRO) revealed that no contamination was detected in these wells. In addition, soil samples that were collected during the well installation also showed no DRO contamination.

Based on the modeling results and the well sampling analysis mentioned above, the MEDEP will no longer impose a strict pumping limit of 450 GPD on the supply well at the former Defense Fuel Farm. The Town of Harpswell, at its own discretion, may consider increasing the pumping rate up to 6.25 GPM as reflected by the model. The Town must be aware that groundwater modeling is only a predictive method to understand potential impact which may occur at higher pumping rates. The 6.25 GPM

AUGUSTA
17 STATE HOUSE STATION
AUGUSTA, MAINE 04333-0017
(207) 287-7688 FAX: (207) 287-7826
RAY BLDG., HOSPITAL ST.

BANGOR
106 HOGAN ROAD
BANGOR, MAINE 04401
(207) 941-4570 FAX: (207) 941-4584

PORTLAND
312 CANCO ROAD
PORTLAND, MAINE 04103
(207) 822-6300 FAX: (207) 822-6303

PRESQUE ISLE
1235 CENTRAL DRIVE, SKYWAY PARK
PRESQUE ISLE, MAINE 04769-2094
(207) 764-0477 FAX: (207) 760-3143

web site: www.maine.gov/dep

printed on recycled paper

rate predicted by the model may or may not reflect actual conditions at the site. Consequently, the following conditions must be met if the Town of Harpswell intends to use the well at a pumping rate up to 6.25 GPM.

- The MEDEP will require two years of quarterly monitoring for gasoline range organics (GRO) and DRO to be conducted on the supply well due to the presence of nearby petroleum contamination. Following this period, sampling schedules will be reconsidered.

- No other locations for groundwater extraction will be permitted on the property without a full hydrologic study demonstrating that clean water can be removed from the aquifer without affecting the distribution of existing contamination. A prior approval from the MEDEP will also be required.

- The Town needs to work directly with DHHS to secure the appropriate permit for the supply well.

- The Town will prepare a contingency plan to address the potential for low level fuel contamination in the supply well. If the well should become contaminated, the Town will be responsible for mitigating the risk associated with site-related contamination (e.g., through filtration).

If the Town of Harpswell wishes to pump at a higher rate, exceeding the 6.25 GPM , the Town will be required to secure the services of a hydrogeologic consulting firm to assess the appropriateness of GZA's recommended and DHHS's approved rate of 12 GPM.

Attached please find copies of the W&C model results and the July 10, 2007 memo to Jean Firth from Hank Andolsek. In the spirit of cooperation between the town of Harpswell and the MEDEP, we encourage you to comply with the requirements outlined above.

If you have any questions related to this letter feel free to contact me at (207) 287-7709.

Sincerely,

N. Akladiss

Naji Akladiss, P.E.
Remedial Project Manager
Division of Remediation
Bureau of Remediation & Waste Management

cc: Ted Wolfe, MEDEP
Gail Lipfert, MEDEP
File

ATTACHMENT A-4

Letter from MeDEP dated November 16, 2010
Regarding VRAP Program

STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

JOHN ELIAS BALDACCI
GOVERNOR

DAVID P. LITTELL
COMMISSIONER

RECEIVED
NOV 18
PLANNING OFFICE

November 16, 2010

Ms. Carol Tukey, Town Planner
Town of Harpswell
P.O. Box 39
Harpswell, Maine 04079

Re: Mitchell Field, Harpswell—Process for participation in the Voluntary Response Action Program

Ms. Tukey:

Earlier this year, you had requested information regarding the Maine Department of Environmental Protection's (the "Department") Voluntary Response Action Program ("VRAP"), and how the Mitchell Field property in Harpswell (aka the Former Defense Fuel Farm) might benefit from participation in the VRAP. During May 2010, you accompanied Jean Firth and me on a walk of the property. This letter outlines the process moving forward for participation in VRAP, given the conceptual redevelopment plan, A Master Plan for Mitchell Field (the "Plan"), you had presented for the property.

The Plan proposes very limited redevelopment of the property, and is quite compatible with the Department's understanding of potential and real environmental issues at the property that would need to be considered during the redevelopment.

Specifically, any entity looking to redevelop a portion of the property in any of the locations proposed in the Plan (Mixed-Income Cluster Housing, Marine Business Zone I, and Marine Business Zone II) would need to adhere to the following conditions to participate as an applicant to VRAP and receive the protections provided by VRAP:

1. The supply well on the property, which may be used as a source of potable water, may not be pumped at a rate exceeding 6.25 gallons per minute (i.e. no more than 9000 gallons per day) at any time, as outlined in a September 15, 2008 from Department Project Manager Naji Akladiss to the Town of Harpswell. Routine sampling of the well for petroleum contaminants (extractable petroleum hydrocarbons, volatile petroleum hydrocarbons and volatile organic compounds) will be necessary by the user(s) of the well, as outlined in the aforementioned letter. Should petroleum contamination be discovered during sampling, treatment

of the well will be necessary. Any sampling and treatment costs will be the responsibility of the VRAP applicants, their successors and/or assigns.

2. If a greater water extraction rate is desired, or if additional potable water wells are proposed, the VRAP applicant will need to do a hydrogeological study to demonstrate that groundwater will not be adversely affected (both on and offsite) by significantly changing the characteristics of the petroleum contamination plume that exists at the property.

3. No digging on the property will be conducted without prior written approval of the Department. The VRAP applicant is responsible to provide the Department with information regarding any proposed digging, which may include the performance of limited environmental sampling to provide data demonstrating that the proposed digging does not represent an unacceptable health risk. The costs of such limited environmental sampling will be the responsibility of the VRAP applicants, their successors and/or assigns.

4. Use of the property for residential purposes without the prior written permission of the Department is prohibited. That said, the proposed location for "Mixed-Income Cluster Housing" is the most logical location and most acceptable portion of the property for residential uses. A VRAP applicant for this portion of the property would need to do limited assessment (at their cost) on this portion of the property to confirm that residential uses would meet the residential use criteria in applicable DEP guidance. Other uses, such as those contemplated in the Plan (e.g. Marine Business Zones I & II) do not require prior written approval of the Department, provided that all other conditions listed herein are followed.

5. The VRAP applicant will adhere to local, state and federal laws relating to lead-based paint, asbestos, and polychlorinated biphenyl (PCB) containing caulking during occupancy, renovation, demolition and/or disposal of the existing structures on the property. All costs related to sampling, managing, handling, removing and/or disposing of such materials will be the responsibility of the VRAP applicants, their successors and/or assigns.

6. You should also note that all construction, alterations, or improvements on the property are subject to the formal advance approval of the Federal Aviation Administration ("FAA") for compliance with the regulations set forth in 14 CFR Part 77, "Objects Affecting Navigable Airspace".

During redevelopment of any portion of the property, both the potable water supply and wastewater disposal will need to be considered and addressed. The feasibility of a community water supply and community wastewater disposal system should be evaluated. Any redevelopment plans that may change groundwater flow will require a hydrogeological evaluation.

Moving forward, a separate VRAP can be done for each portion of the property, if the redevelopment occurs on different portions at different times. This will accommodate any redevelopment plans an entity may have, and not prohibit redevelopment in stages.

Redevelopment plans that do not include adherence to the abovementioned conditions will require the involvement of the United State Navy/ Department of Defense before a potential VRAP applicant will be accepted into the program and a proposed redevelopment could be approved.

If you have questions regarding this letter, please feel free to call me at 207-287-4854.

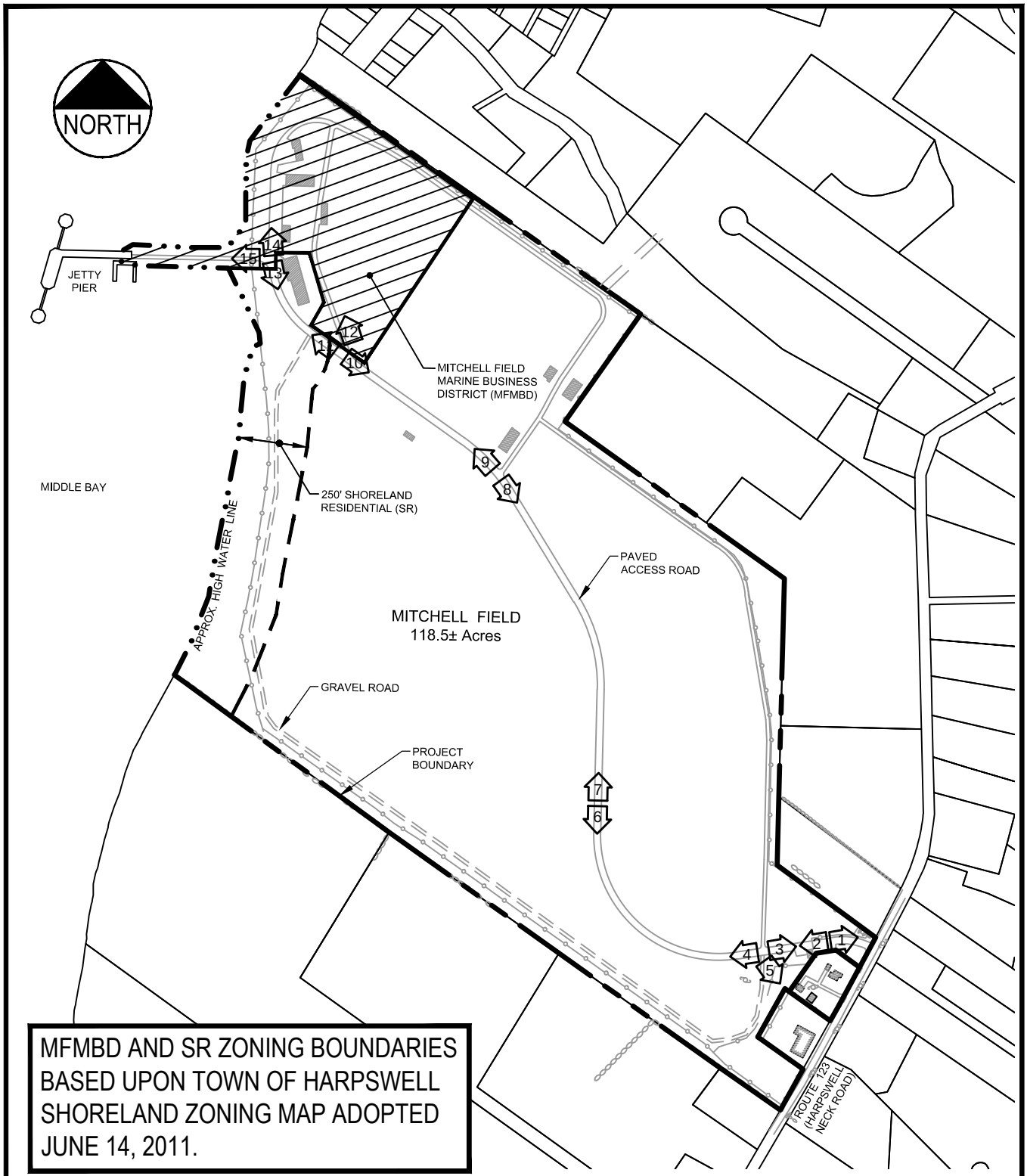
Sincerely,

Nicholas J. Hodgkins
Voluntary Response Action Plan
Division of Remediation

Pc: Naji Akladiss, Maine DEP

ATTACHMENT B

Access Road Photographs



MFMBD AND SR ZONING BOUNDARIES BASED UPON TOWN OF HARPSWELL SHORELAND ZONING MAP ADOPTED JUNE 14, 2011.

7 PHOTO NUMBER & VIEWPOINT

GRAPHIC SCALE

0 250 500 1000

1 inch = 500 ft.

MITCHELL FIELD
HARPSWELL, MAINE

ACCESS ROAD EXISTING CONDITIONS PHOTO KEY MAP

DeLuca-Hoffman Associates, Inc.
778 MAIN STREET, SUITE 8
SOUTH PORTLAND, ME 04106
207.775.1121
WWW.DELUCAHOFFMAN.COM

DRAWN:	CDD	DATE:	FEB. 2012
DESIGNED:	JAL	SCALE:	1" = 500'
CHECKED:	JAL	JOB NO.	3059.01
FILE NAME:	3059-PROPOSED BASE		

ATTACHMENT

B-1

Photo 1 – View of access road (sta 1+60) back towards Route 123.

Photo 2 – View of access road (sta 1+60) towards entry gate.

DeLUCA-HOFFMAN ASSOCIATES, INC.
CONSULTING ENGINEERS
778 MAIN STREET, SUITE 8
SOUTH PORTLAND, MAINE 04106
TEL. 207-775-1121
FAX: 207-879-0896
E-MAIL: dhai@delucahoffman.com

Town of Harpswell
Photos Taken – 12/6/11
(DHAI JN 3059)

Photo 3 – View of access road (sta 4+00) looking back station.

Photo 4 – View of access road (sta 4+00) looking ahead.

DeLUCA-HOFFMAN ASSOCIATES, INC.
CONSULTING ENGINEERS
778 MAIN STREET, SUITE 8
SOUTH PORTLAND, MAINE 04106
TEL. 207-775-1121
FAX: 207-879-0896
E-MAIL: dhai@delucahoffman.com

Town of Harpswell
Photos Taken – 12/6/11
(DHAI JN 3059)

Photo 5 – View of water tower supports and fence enclosure.

Photo 6 – View of access road (sta 13+50) looking back station.

DeLUCA-HOFFMAN ASSOCIATES, INC.
CONSULTING ENGINEERS
778 MAIN STREET, SUITE 8
SOUTH PORTLAND, MAINE 04106
TEL. 207-775-1121
FAX: 207-879-0896
E-MAIL: dhai@delucahoffman.com

Town of Harpswell
Photos Taken – 12/6/11
(DHAI JN 3059)

Photo 7 – View of access road (sta 13+50) looking ahead.

Photo 8 – View of access road (sta 26+00) looking back station.

DeLUCA-HOFFMAN ASSOCIATES, INC.
CONSULTING ENGINEERS
778 MAIN STREET, SUITE 8
SOUTH PORTLAND, MAINE 04106
TEL. 207-775-1121
FAX: 207-879-0896
E-MAIL: dhai@delucahoffman.com

Town of Harpswell
Photos Taken – 12/6/11
(DHAI JN 3059)

Photo 9 – View of access road (sta 26+00) looking ahead.

Photo 10 – View of access road (sta 33+00) looking back station.

DeLUCA-HOFFMAN ASSOCIATES, INC.
CONSULTING ENGINEERS
778 MAIN STREET, SUITE 8
SOUTH PORTLAND, MAINE 04106
TEL. 207-775-1121
FAX: 207-879-0896
E-MAIL: dhai@delucahoffman.com

Town of Harpswell
Photos Taken – 12/6/11
(DHAI JN 3059)

Photo 11 – View of access road (sta 33+00) looking ahead.

Photo 12 – View of secondary access road (sta 33+00) into MBD.

DeLUCA-HOFFMAN ASSOCIATES, INC.
CONSULTING ENGINEERS
778 MAIN STREET, SUITE 8
SOUTH PORTLAND, MAINE 04106
TEL. 207-775-1121
FAX: 207-879-0896
E-MAIL: dhai@delucahoffman.com

Town of Harpswell
Photos Taken – 12/6/11
(DHAI JN 3059)

Photo 13 – View of access road (sta 38+00) looking back station.

Photo 14 – View of access road (sta 38+00) looking ahead into MBD.

DeLUCA-HOFFMAN ASSOCIATES, INC.
CONSULTING ENGINEERS
778 MAIN STREET, SUITE 8
SOUTH PORTLAND, MAINE 04106
TEL. 207-775-1121
FAX: 207-879-0896
E-MAIL: dhai@delucahoffman.com

Town of Harpswell
Photos Taken – 12/6/11
(DHAI JN 3059)

Photo 15 – View from access road (sta 38+00) looking at Jetty-Pier access.

DeLUCA-HOFFMAN ASSOCIATES, INC.
CONSULTING ENGINEERS
778 MAIN STREET, SUITE 8
SOUTH PORTLAND, MAINE 04106
TEL. 207-775-1121
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E-MAIL: dhai@delucahoffman.com

Town of Harpswell
Photos Taken – 12/6/11
(DHAI JN 3059)

ATTACHMENT C-1

Summary of Groundwater Quality Parameters

TABLE 4
SUMMARY OF GROUNDWATER QUALITY PARAMETERS
DFSP-Casco Bay, South Harpswell, Maine

			1998 Groundwater Quality Data			*2001 Groundwater Quality Data*									
			NWSW	*1998 Drinking Water Standards*		Pre-test Sampling			Pump Test Sampling			Post-test Sampling		*2001 Drinking Water Standards*	
						Sampled on 19-Feb-2001			6-Mar-01	7-Mar-01	8-Mar-01	Sampled on 13-Mar-01			
PARAMETER	**UNITS**	**METHOD**	25-Jun-98	*MCLs*	*MEGs*	NWSW	GZOW-1S	GZOW-1D	NWSW	NWSW	NWSW	GZOW-1S	GZOW-1D	*MCLs*	*MEGs*
Low Flow Sampling Parameters:															
DO	mg/L	LFS				2.92	6.93	2.87	NT	3.22	3.57	5.55	3 84		
ORP	mV	LFS				-204.9	60.6	-80.7	NT	-111	-110	152	-83 6		
pH		LFS				7.71	7.65	7.43	NT	7.22	7.19	7.17	7.11	*6.5-8.5**	
Specific Conductance	µS/cm	LFS				193	229	209	NT	236	235	314	232		
Temperature	°C	LFS				6.19	6.49	8.27	NT	9.03	8.96	7 34	7.59		
Turbidity	NTU	LFS	<1.0 [3]			22.9	711	0 3	NT	0	0	102.5	13 6	*1*	
Physical Properties:															
Alkalinity	as $CaCO_3$, mg/L	EPA 310.2	64			62			70.8	69.1	69				
Hardness		2340B				48.3			15	17	18.3				
Color											8			*15**	
Petroleum Hydrocarbons :															
DRO	µg/L	ME 4.1.25	<50	*50*		<50	<50	<50	<50	<50	<50	<50	<50	*50*	
GRO	µg/L	ME 4 2.17	<10	*10*		<10	<10	<10	<10	<10	<10	<10	<10	*10*	
Volatile Organic Compounds:															
Benzene	µg/L	EPA 8260	<5	*5*	*5*	<0.50	<0 50	<0 50	<0.50	<0.50	<1.0	<0.50	<0.50	*5*	*12*
Toluene	µg/L	EPA 8260	<5	*1,000*	*1,400*	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<0.50	<0 50	*1,000*	*1,400*
Ethylbenzene	µg/L	EPA 8260	<5	*700*	*700*	<0.50	<0 50	<0.50	<0.50	<0.50	<1.0	<0 50	<0 50	*700*	*70*
Xylene, total	µg/L	EPA 8260	<5	*10,000*	*600*	<0.50	<0 50	<0 50	<0.50	<0.50	<1.0	<0.50	<0 50	*10,000*	*14,000*
MTBE	µg/L	EPA 8260	<5		*50*	<1.0	<1.0	<1 0	<1.0	<1.0	<1.0	<1.0	<1 0	*35*	*35*
Napthalene	µg/L	EPA 8260	<5		*25*	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	*14*	*20* [2]
Total VOCs	µg/L	EPA 8260	<5			ND	ND	ND	ND	ND	ND	ND	ND		
Elemental Compounds:															
Arsenic	mg/L	EPA 6010	<0.008	*0.05*		0.00890			0.00870	0.00460	0.0053			*0.05*	*0.01*
Barium	mg/L	EPA 6010	0.0208	*2*	*1.5*	0.0292			0.0172	0.0185	0.020			*2*	*2*
Cadmium	mg/L	EPA 6010	<0.01	*0.005*	*0.005*	<0.00200			<0.00200	<0.00200	<0.0005			*0.005*	*0.0035*
Calcium	mg/L	EPA 6010B	4.01			11.2			3.11	3.35					
Chloride	mg/L	EPA 4110B	10	*250*		6.90			21.30	19.8	11			*250**	
Chromium	mg/L	EPA 6010	<0.015	*0.1*		<0.00200			<0.00200	<0.00200	<0.0005			*0.1*	*0.04*
Copper	mg/L		<0.025	*1.3**							<0.0005			*1.3***	*1.3*
Fluoride	mg/L		0.5	*4*	*2.4*						0.43			*4*	*1.68*
Iron, Total	mg/L	EPA 6010	0.67	*0.3***		4.09			0.48	0.537	0.53			*0.3**	
Lead	mg/L	EPA 6010	<0.005	*0.015**	*0.02*	<0.00500			<0.00500	<0.00500	<0.0005			*0.015***	*0.01*
Magnesium, Total	mg/L	EPA 6010	2.5			4.59			1.85	2.14					
Manganese, Total	mg/L	EPA 6010	0.0344	*0.05**	*0.2*	0.0842			0.0280	0.0294	0.03			*0.05**	*0.05*
Mercury, Total	mg/L	EPA 7470A	<0.200	*0.002*	*0.002*	<0.00020			<0.00020	<0.00020	<0.0002			*0.002*	*0.002*
Nitrate, as N	mg/L	EPA 4110B	<0.05	*10*	*10*	<0.10			<0.20	<0.20	<0.2			*10*	*10*
Nitrite, as N	mg/L	EPA 4110B	<0.050	*1*	*1*	<0.05			<0.01	<0.01	<0.01			*1*	*1*
Selenium	mg/L	EPA 6010	<0.010	*0.05*	*0.01*	0.0244			<0.0240	<0.0240				*0.05*	*0.035*
Silver	mg/L	EPA 6010	<0.015		*0.05*	<0.0130			<0.0130	<0.0130	<0.0005			*0.1**	*0.035*
Sodium	mg/L	EPA 6010B	34.7	*20*		16.7			37.5	37.0	34.0			*20*	
Sulfate	mg/L	4110B	25	*500*		15.1			16.0	18.0				*250**	
Zinc	mg/L	EPA 6010	<0.0250	*5**		<0.0200			<0.0200	<0.0200	<0.001			*5**	*2*
Other EI Parameters:															
Gross Alpha	pci/L										0.54 +/-0.30			*15*	
Radon	pci/L										745 +/-32			*300-4000*	
Total Coliform	%										"J" 0			*5%*	
E. Coli	%										"J" 0				

NOTES:

"MCL" refers to the Maximum Contaminant Level promulgated by the USEPA (Drinking Water Regulations and Health Advisories) and adopted by the State of Maine as an enforceable standard for Drinking Water Quality MCLs represent regulatory enforceable standards which apply to public water supplies and are based opun technological feasibility and cost of treatment, plus health effects.

"*" indicates a secondary MCL (SMCL) which is not necessarily an enforceable standard.

"**" indicates that an action level has been established for the specified parameter.

"MEG" refers to the State of Maine Maximum Exposure Guidelines which represent the Department of Human Services recommendation for maximum levels of contaminants in drinking water.

Exceedances of MEGs and/or MCLs have been indicated by yellow highlighting for the specific parameter and sampling round

"<" Values preceded by an inequality sign (i.e. <1.0) signify that these concentrations were below the laboratory reporting limits.

"J" indicates that the result is considered an estimate

The U.S. EPA is currently considering establishing a maximum contaminant level for radon in public water supplies at 300 to 4,000 pCi/L.

ATTACHMENT C-2

Water Storage Tank Inspection Report

UTILITY SERVICE

100,000 Gallon Elevated Steel "Mitchell Field" Water Storage Tank Inspection Report

DeLUCA-HOFFMAN ASSOCIATES, INC.
for
Town of Harpswell, ME

Prepared For:
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January 2012

General Information

INTRODUCTION

On **December 22, 2011**, **Utility Service Co., Inc.** conducted a **Visual Inspection** on the **100,000 gallon Elevated "Mitchell Field Tank" in Harpswell, ME.** The purpose of the inspection was to determine the condition of the **coatings** and **structure**, and to evaluate the tank for compliance with **sanitation** guidelines, **safety** & **security** regulations and guidelines in accordance with **AWWA, OSHA** and **Maine Department of Environmental Protection (ME DEP) guidelines**.

Please note due to unsafe climbing conditions of the unsecured dome ladder, a visual inspection of the tank interior, interior paint sample collection and interior structural assessment could not be performed. This report is based on a visual inspection of the exterior from the ground up to the cat walk of the dome. In order to perform the interior inspection, it is proposed the dome ladder be welded or secured to the tank.

The information gained from this inspection will be used to compile recommendations for renovations. In this report, you will find a description of the condition of this tank along with photographs to support the recommendations.

TANK DETAILS

CAPACITY:	100,000 Gallons	**DESIGN:**	Elevated
INSPECTION DATE:	December 22, 2011	**INSPECTOR:**	Scott Kelley
CONSTRUCTION STYLE:	Welded Steel	**BUILDER or** Architect & Engineer**:**	Thomas Worcester, Inc. Boston, MA
CONSTRUCTION DATE:	1952 est.	**HEIGHT:** **DIAMETER:**	104 feet 28 feet
EXTERIOR COATING:	Polyester Polyurethane	**EXTERIOR LEAD/CHROMIUM PRESENCE:**	Lead: 1,010 ppm Chromium: ND ppm
INTERIOR COATING:	Could not be assessed	**INTERIOR LEAD/CHROMIUM PRESENCE:**	Could not be assessed

Exterior Coatings Conditions

TANK SHELL

Exterior surfaces of this tank are currently coated with a **Polyester Polyurethane system** that is in **Poor condition**.

The exterior surfaces were tested for the presence of lead and were found to be **positive** using the "Total Lead" method. Exterior coating system average 7.5 mils dry film thickness. Adhesion of the exterior coating system is **fair - good**. Exterior coatings were also tested for the presence of Chromium and found to be **negative**.

The exterior coating system exhibits some chalking, cracking and peeling. The coating system has long exceeded its normal life cycle and continues to deteriorate. There are numerous areas on the tank to include legs, struts, riser, ladders, cat walk and dome where coatings have failed and have exposed steel. The roof and underbelly of the tank have little to no coatings left. Without proper coating this exposed steel will continue to corrode and steel will be lost. Lost steel will degrade structural integrity over time. Some graffiti exists on the dome. The balcony catwalk floor has areas of exposed steel and corrosion.

TANK ROOF

The tank roof is a welded steel dome roof and appears to be in good, serviceable condition. It is not known if the roof has interior beam support. This information could not be gathered due to the unsafe condition of the dome ladder and inability to access the roof hatch.

Coating system on the interior Tank Roof could not be assessed.

Coating system on the exterior Tank Roof is in **Extremely Poor condition**. There is chalking, some surface corrosion, flaking, and metal is exposed in numerous areas. This information was gathered from the cat walk as best possible.

The exterior coating system has exceeded its normal life cycle and continues to deteriorate. Adhesion of the exterior coating system on the roof is **fair - good**.

RECOMMENDATIONS

- **Exterior should receive surface preparation to remove any surface corrosion and cracking paint, a power wash cleaning and then receive a full three coat system consisting of a primer coat, intermediate coat and finish coat**
- **Additional surface preparation is required on the balcony catwalk floor and spot welding is required.**
- **Application of a three coat system to all exterior surfaces satisfies the applicable requirements of AWWA Standard D102-06**

Interior Coatings Conditions

SIDEWALLS, ROOF AND AREA ABOVE HIGH WATER LEVEL

The interior coating system on the sidewalls, roof and area above water level could not be inspected**. Recommendations are based on tank information available at this time and experience only.** Without access to the interior, a complete and accurate assessment cannot be provided.

FLOOR

The interior coating system on the floor could not be inspected**.**

RECOMMENDATIONS

- **Interior should receive a SSPC-SP10 "Near White" blast cleaning and then receive two coats of an NSF approved epoxy coating**
- **Perform a washout inspection every two years to inspect interior surface areas and remove sediment accumulation.**

Safety/Sanitation/Structural/Security Conditions

SAFETY

Safety Climb System

There is **no safety climb** on the access ladder or the dome ladder. The access ladder has a cage.

Ladders

The leg Access ladder is clear of obstructions and in good condition but extends to the ground which makes it easy for unwanted climbers. The Dome ladder is **not secured** to the tank and does not extend down to the balcony floor creating a very **unsafe climbing condition**. The ladder is also at risk of detaching and falling to the ground.

Handrails

Handrails on the tank catwalk meet OSHA 42″ height standards. Posts ever 8′ and toe plate on the catwalk guardrail meet OSHA standards. Open areas of the lattice on the catwalk rail system **exceeds OSHA 21″ open space** requirements for guardrails.

Shell Access Hatch

None.

Riser Access Hatch

Riser has a 24″ round bolted AWWA compliant access hatch.

Roof Access Hatch

Could not be inspected.

Aviation Warning Lights

Could not be inspected.

RECOMMENDATIONS

- **Install Cable Safety climb system on Exterior Access ladder and Dome ladder and remove ladder cage**
- **Remove a small portion of the Access ladder at the bottom in order to prevent undesired climbers**
- **Extend Dome ladder to the catwalk and weld dome ladder to the tank**
- **Add additional lattice strips to the balcony handrails to reduce open space**

SANITATION

Roof Hatch

Could not be inspected.

Roof Vent Screen

Could not be inspected. From the ground it would appear the vent is outdated.

Overflow Assembly Screen and Flapper

The existing overflow pipe is serviceable and extends to grade and is in compliance with AWWA guidelines, which require the overflow to end 12-inches to 24-inches above grade. A **screen and flapper are not in place** on the overflow creating exposure to the environment. Some of the overflow brackets are no longer serviceable.

RECOMMENDATIONS

- **Install new 24" Frost proof vent with screen**
- **Add screen and flapper to the overflow**
- **Replacement of overflow brackets**

STRUCTURAL

Ladders

Exterior Access ladder is in good condition and serviceable. Coatings have failed in areas and there is some exposed steel. It is not known if the tank is equipped with an interior ladder. The Dome ladder is a swivel style with wheels designed to move around the tank dome. This style of ladder is no longer recommended. The Dome ladder has impacted the coatings on the dome and exposed steel.

Legs

The four 24" round pipe legs are in good structural condition. There have been holes placed in one of the legs for the purpose of wiring. An old control box is mounted on the access ladder leg.

Handrails

Handrails on the cat walk of the tank meet the OSHA 42" height standards. The lattice on the catwalk handrail has open space that is not OSHA compliant. The balcony catwalk handrails are structurally in satisfactory condition. It is not known if there are riser handrails on the interior of the tank. There are signs of ponding on the catwalk floor.

Hatches

Riser has a 24" round bolted AWWA compliant access hatch and appears to be in good condition and serviceable. The roof hatch could not be inspected.

Welds / Bolts / Rivets

Some of the weld seams are showing corrosion on the balcony catwalk floor. Leg and Riser anchor bolts and dome bolts all appear to be in good condition. Strut bolts are in good condition. The riser hatch bolts are corroded.

Overflow System

The existing overflow pipe is serviceable but **does not extend to grade** therefore it is not in compliance with AWWA guidelines, which require the overflow to end 12-inches to 24-inches above grade. A screen and flapper are not in place on the overflow creating exposure to the environment. Some of the overflow brackets are no longer serviceable.

Target and Float Assembly

Tank does not have a Target and Float assembly.

Vents

From the ground it appears the vent is out of date and should to be replaced.

Anchor Chairs and Bolts

Anchor chairs and bolts are in good condition and maintaining structural integrity.

Wind Rods / Struts / Riser Rods

Wind rods are in satisfactory condition but should be checked and adjusted before coating. The two levels of I-Beam Struts are in good condition. Riser rods are in good condition. Components are satisfactory for supporting structural integrity.

Foundations

The riser foundation and the leg footing foundation are in need of major repairs. The foundations are above grade with sufficient run off and drainage. Suspect poor quality of concrete.

Site and Additional Information

There is a tree growing in front of the riser manway hatch. A small wood structure is in close proximity to the tank inside the fence line and a concrete structure is attached to the riser. These are obstructions for proper renovation and maintenance of the tank

RECOMMENDATIONS

- **Install new 24" Frost proof vent with screen**
- **Add screen and flapper to the overflow and replace several overflow brackets**
- **Weld Dome ladder to the bowl**
- **Replace bolts and seal on riser manway hatch**
- **Adjust wind rods prior to new coating system**
- **Repair/replace, grout and seal the riser foundation and leg footing foundations**
- **Add additional weep holes to the balcony catwalk floor to assist with drainage**

- **Install additional lattice on the catwalk handrails**
- **Remove all trees and unnecessary structures close to the tank**

SECURITY

Ladder Gate Climb Prevention Shield

Tank is **NOT equipped with proper ladder gate**.

Hatches Locked

Could not inspect the roof hatch.

Site

The tank site is fenced and is secured.

RECOMMENDATIONS

- **Install Ladder Gate with lock on Access Ladder**

SUMMARY AND RECOMMENDATIONS

SUMMARY

Overall this elevated steel water storage tank is in **good condition** structurally and needs some minor repairs. The exterior coating system is in **very poor condition and has failed**. There is significant coating failure, some rust, and minor corrosion. The interior coating system and structure was not accessible for inspection due to safety concerns of the dome ladder.

In addition to the exterior and interior coating recommendations, a few modifications are recommended to bring this tank into current standards and meet all Safety, Structure, Security, Sanitary and Coating recommendations.

RECOMMENDATIONS

Exterior

- **Exterior should receive surface preparation to remove any surface corrosion and cracking paint, a power wash cleaning and then receive a full three coat system consisting of a primer coat, intermediate coat and finish coat**
- **Additional surface preparation is required on the balcony catwalk floor and some spot welding is required.**
- **Application of a three coat system to all exterior surfaces satisfies the applicable requirements of AWWA Standard D102-06**

Interior

- **Interior should receive a SSPC-SP10 "Near White" blast cleaning and then receive two coats of an NSF approved epoxy coating**
- **Perform a washout inspection every two years to inspect interior surface areas and remove sediment accumulation.**

Additional Repairs, Renovations and Modifications

- **Install Cable Safety climb system on Exterior Access ladder and Dome ladder and remove ladder cage**
- **Remove a small portion of the Access ladder at the bottom in order to prevent undesired climbers**
- **Extend Dome ladder to the catwalk and weld dome ladder to the tank**
- **Add additional lattice strips to the balcony handrails to reduce open space**
- **Install new 24" Frost proof vent with screen**
- **Extend Overflow pipe down to 12-24 inches above grade with screen and flapper**
- **Replace bolts and seal on riser manway hatch**
- **Adjust wind rods prior to new coating system**
- **Repair/replace, grout and seal the riser foundation and leg footing foundations**

- **Add additional weep holes to the balcony catwalk floor to assist with drainage**
- **Install Ladder Gate with lock on Access Ladder**
- **Remove all electrical wiring on tank and inside tank legs and fill any holes previously used to run wire prior to coating**
- **Remove all trees and unnecessary structures close to the tank**

100,000 Gallon Elevated Steel "Mitchell Field" Water Storage Tank Harpswell, ME

Photo #1

Photo #2

Photo #3 **Overflow**

Photo #4

Photo #5

Photo #6

Photo #7

Photo #8

Photo #9 **Leg foundation**

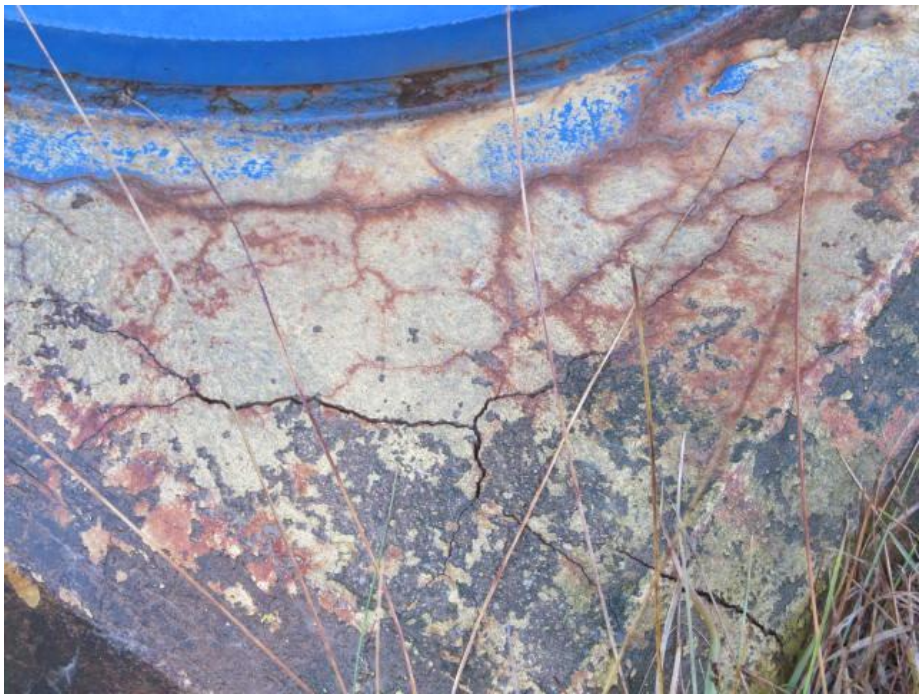


Photo #10

Photo #11 **Riser attached to structure**

Photo #12

Photo #13

Photo #14

Photo #15 **Control box on leg**

Photo #16 **Wind rod attached to leg**

Photo #17 **Leg with hole and wires**

Photo #18

Photo #19

Fence and structures

Photo #20

Photo #21 **Overflow brackets**

Photo #22 **Access ladder base**

Photo #23 **Access ladder with cage**

Photo #24

Photo #25 **Corrosion on ladder**

Photo #26

Photo #27 **Top of access ladder at point of balcony**

Photo #28 **Catwalk**

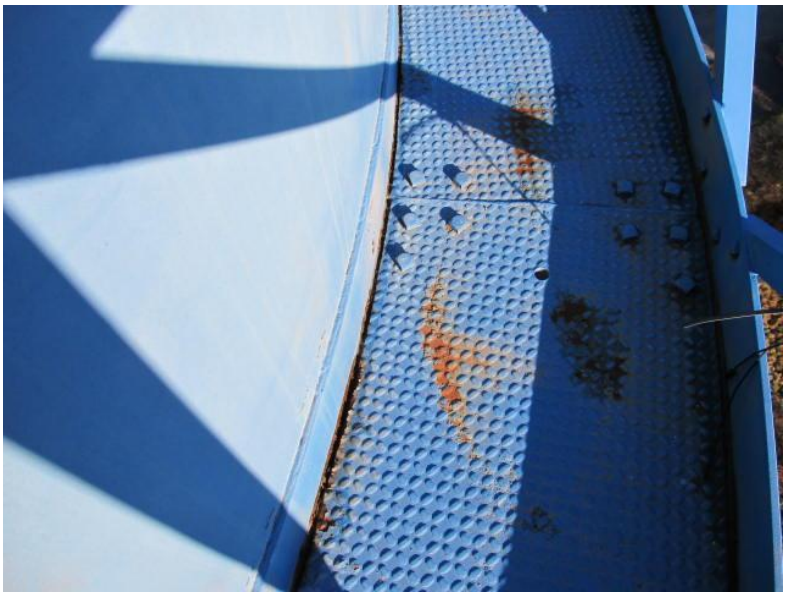


Photo #29

Photo #30

Photo #31

Photo #32

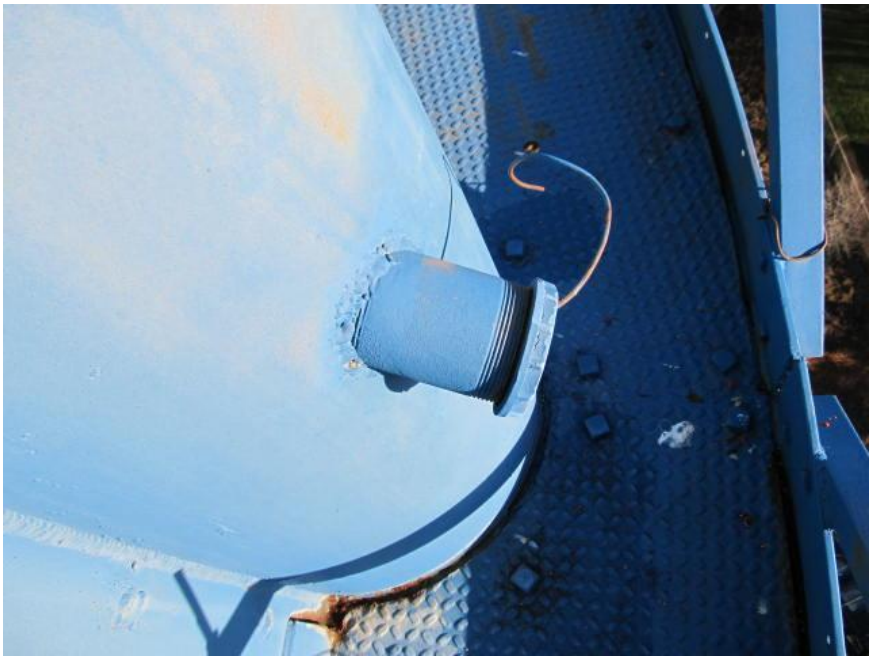


Photo #33

Photo #34

Photo #35 **Dome ladder**

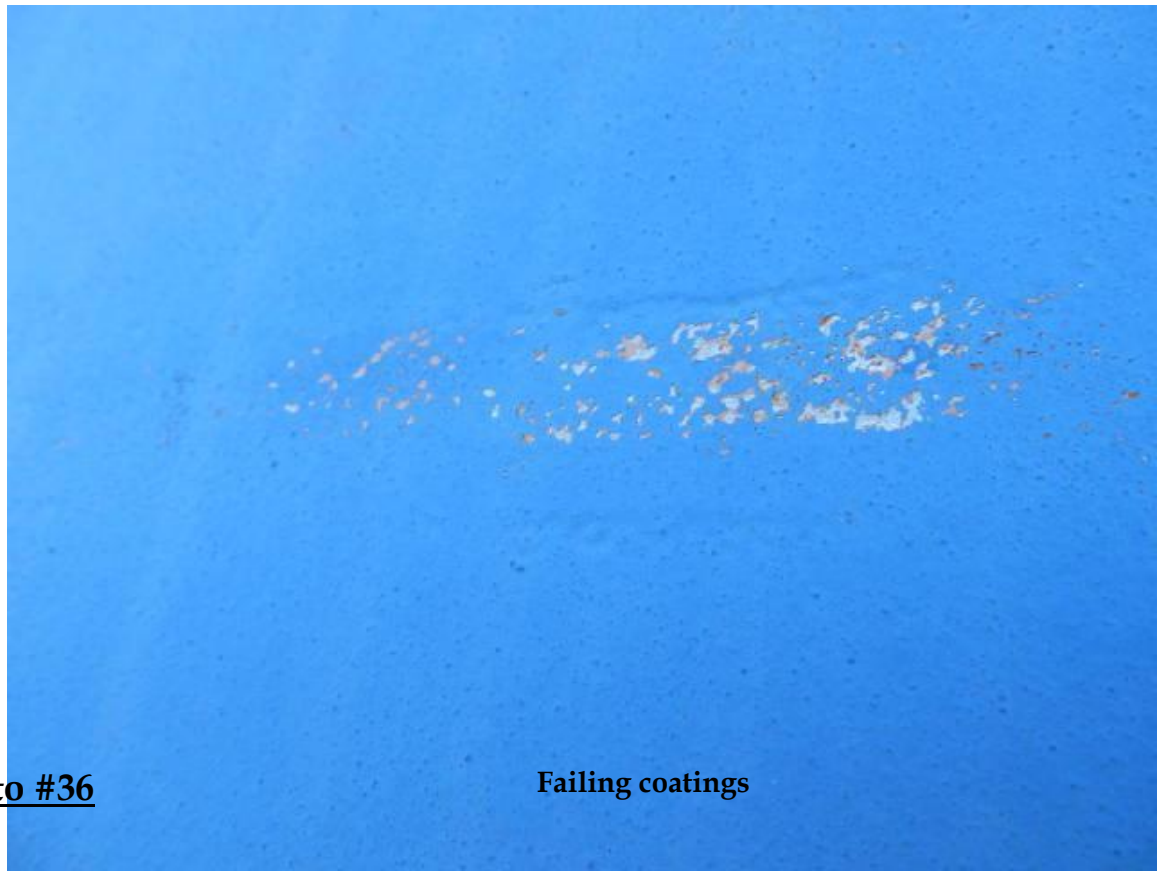


Photo #36 **Failing coatings**

Photo #37

Photo #38

Photo #39

Photo #40

Photo #41

Photo #42

Photo #43

Photo #44

Photo #45

Top of tank

Photo #46

Photo #47

Photo #48

Photo #49 **Vent**

Photo #50 **Bottom of bowl**

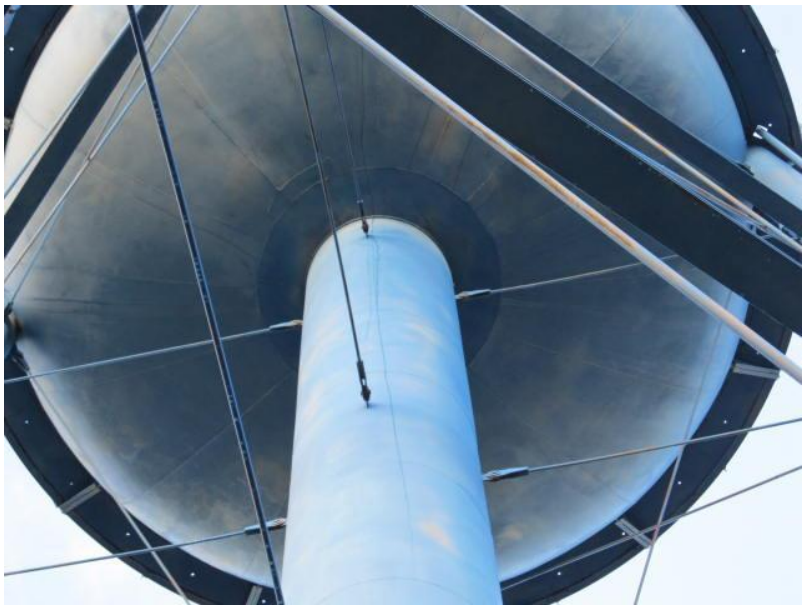


Photo #51 **Wind rods and riser rods**

Photo #52

Photo #53

Struts

Photo #54

Photo #55 **Riser**

Photo #56

Photo #57 **Riser rods**

Photo #58 **Under balcony catwalk**

Photo #59

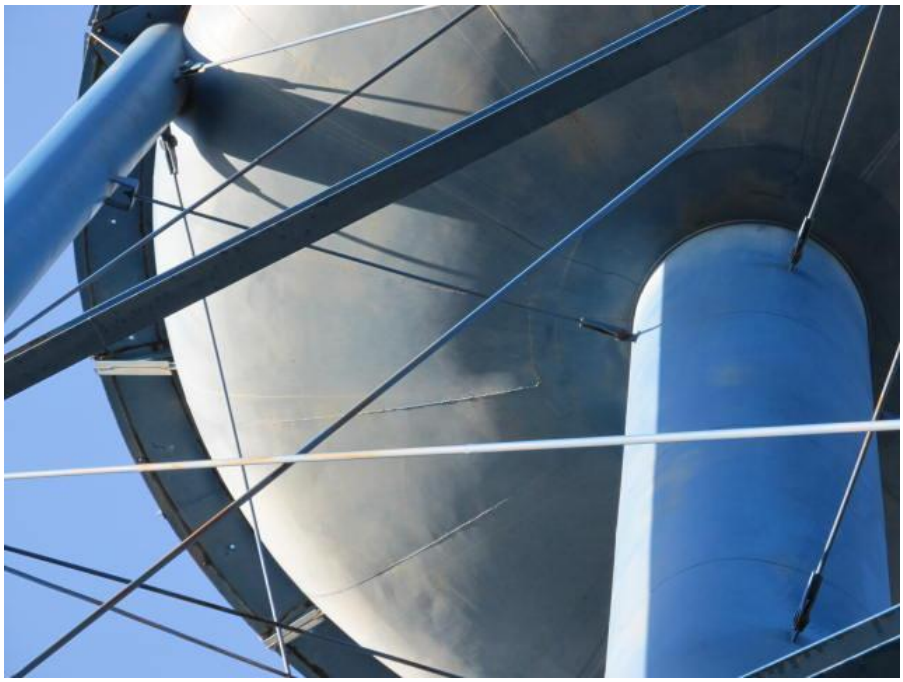


Photo #60

Photo #61

Photo #62

Photo #63

Photo #64

ATTACHMENT C-3

Cost Estimate Quotation for Water Treatment Equipment

Preliminary Report for Water Treatment for Town of Harpswell

Prepared by

Jeffrey Twitchell

Air & Water Quality

160 US Route 1, Freeport, ME 04351

Treatment Goals

- A water treatment system that will treat water at a rate of 20 gallons per minute.
- The treatment should be designed to treat iron and possible VOC contamination.

Testing available to date does not include

- Iron speciation

Assumption(s)

The design assumes iron is in both forms (ferric and ferrous)

Recommendations

The first step should be to apply an oxidation filtration system. This would require the injection of sodium hypochlorite to complete the oxidation of the iron to ferric iron. The water would then have to pass through a retention tank to allow time for the oxidation process to be completed. The retention tank capacity will have to be at least 200 gallons. Once oxidized, the water should then be filtered with automatic backwashing filters. The filters will need to have cross section areas large enough to provide a flow rate of no higher than 5 gpm per square foot. At 20 gpm, the cross section area will have to be 4 square feet. This is approximately equivalent to three 16” diameter filters.

The next treatment step would be three non backwashing 16” diameter filters with activated carbon for adsorption. This would provide VOC protection if VOC contamination should develop in the well. It would be wise to provide a treatment building large enough to allow the addition of three more carbon filters because they will be needed to meet DEP redundancy requirements for these types of system.

Estimated cost for treatment –

$12,500 (oxidation/filtration) for iron reduction

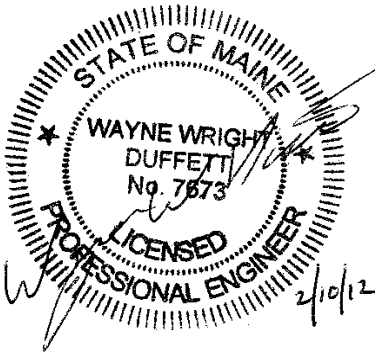
$6,500 (carbon adsorption) for organics

ATTACHMENT D

Inspection of Navy Fuel Pier Report

INSPECTION OF NAVY FUEL PIER

HARPSWELL, MAINE



By
Wayne W. Duffett, P.E.

For
DeLuca-Hoffman Associates, Inc.
and
Town of Harpswell, Maine

PREPARED BY

TEC ASSOCIATES CONSULTING ENGINEERS

46 SAWYER STREET
SOUTH PORTLAND, MAINE 04106

Inspection of Navy Fuel Depot Pier
Harpswell, Maine
19 January 2012
By: Wayne W. Duffett, P.E.

On Thursday 19 January 2012 I inspected the former Navy fuel depot pier in Harpswell, Maine. The purpose of the inspection was to make a preliminary assessment of the pier's condition and determine what areas may require additional study. The inspection was made by boat observing the pier through a full cycle from high to low tide. No diving was done and no calculations or estimates of pier load capacity were made.

For this report I have assumed the pipe pile supported pier to run east to west with pile bents numbered east to west and piles numbered left to right when facing west. The sheet pile pier is south to north consisting of south cell - middle cell - north cell.

SMALL BOAT BERTHS

At the end of the jetty are two sheet-pile finger piers for small boats (pictures 1 and 2). The sheet piles are 16" wide by 6" deep by estimated original thickness ⅜", similar to a PDA-27 section. On the long direction are wales of back-to-back 8" deep channels with 1½" diameter tie-rods upset at the ends to 2" diameter. These wales are near elevation 3.0 MLW. The condition of the sheets, wales, and tie-rods varies.

From the concrete cap down 3'-6" to the high tide line, the original ⅜" thick sheets are reduced to approximately 3/16" except as noted below (pictures 3, 4, and 5). There are some holes through from corrosion and in places holes can be made with a hammer (picture 6), and a few holes that may have been weep holes (picture 7). In the tidal range the sheeting is in good condition except where the wales bear against the outer webs as noted below. There are weep holes below the wales with some enlargement from corrosion; about one in ten is corroded very heavy. Below the low tide line there are holes and heavy corrosion in some outer webs as noted below.

Beginning on the east face of finger pier 1, the north half wales and tie-rods are corroded to zero. The south half wales are corroded to 25% and the tie rods are reduced to ½" to ¾" diameter where they pass through the sheets. Where the wales bear against the sheets, (6) of the (25) outer webs are corroded to zero. Below the low tide line, (3) outer webs are to zero.

On the south face of finger pier 1 there are no wales. Below the low tide line, (1) of (2) outer webs are to zero.

On the west face of finger pier 1 the wales are corroded to 25% and the tie rods are reduced to ½" to ¾" diameter where they pass through the sheets. Where the wales bear against the sheets, (8) of the (22) outer webs are corroded to zero. Below the low tide line, (13) outer webs are to zero.

On the bulkhead between the two finger piers the wales are corroded to 75% and the tie rods are reduced to ½" to ¾" diameter where they pass through the sheets. Where the wales bear against the sheets, (6) of the (23) outer webs are heavily corroded (picture 8). The bulkhead is out of water at low tide but (4) outer webs are to zero at the bottom.

On the east face of finger pier 2 the wales are corroded to zero and the tie rods are reduced to ½" diameter where they pass through the sheets. Where the wales bear against the sheets, (6) of the (22) outer webs are corroded to zero. Below the low tide line, (10) outer webs are to zero.

On the south face of finger pier 2 there are no wales. Below the low tide line, (3) of (3) outer webs are to zero.

On the west face of finger pier 2 the wales are corroded to 50% (picture 9) with no measurement on the tie rods (they are reduced to ½" diameter on the east face). Where the wales bear against the sheets, (5) of the (26) outer webs are corroded to zero. Below the low tide line, (10) outer webs are to zero (picture 10).

PIPE PILE SUPPORTED PIER

The pipe piles are 14" diameter by unknown original wall thickness, filled with concrete. Typical wall thickness in this application would be ½" to possibly ¾". There are twelve bents with batter piles "B" and plumb piles "P" arranged as shown below (picture 11). There are longitudinal girts of pipe at the low tide line in pile lines 2-3-4. There are some lateral sash braces of pipe in bents 3, 4, 5, and 6. There are three longitudinal cast-in-place reinforced concrete deck beams located along pile lines 1-2, 3, and 4-5. Bents 3 and 4 are extended to the north supporting a former pump house. Bent 6 is a double bent where the cast-in-place concrete deck has an expansion joint.

Pile No.	1 2	3	4 5	6 7	8 9
Bents 1-2	B P	P	P B		
Bents 3-4	B P	P	P	P B	P B
Bents 5-12	B P	P	P B		

From the concrete beams down 6'-0" to the high tide line the pipe piles have approximately 3/16" of corrosion loss (picture 12). They are full section through the tidal range. From the low tide line to -2.0 MLW some piles are corroded very heavy while others appear relatively ok. There was limited time to observe them below the low tide line. Estimates of loss shown below are for the steel pile and the concrete fill. In some cases the entire pile and concrete fill were missing below the low tide line, and in other cases partially there.

Bent 3 Pile 1 Pile and concrete to 75%.
All sash corroded to zero along the bottom.

Bent 4	Pile 1	Pile and concrete to 40%.
	Pile 3	Pile and concrete to zero.
	Pile 5	Pile and concrete to zero.
Bent 5	Pile 2	Split vertically about 3' high below the girt and sash braces, possibly the result of water freezing inside (picture 13).
	Pile 4	Pile and concrete to zero (picture 14).
	Pile 5	Pile and concrete to zero.
Bent 6a	Pile 1	Pile and concrete to 25%.
	Pile 2	Pile and concrete to zero (picture 15).
	Pile 5	Pile and concrete to 25%.
Bent 6b	Pile 3	Pile and concrete to zero.
Bent 7	Pile 4	Pile and concrete to 50%.
Bent 8	Pile 1	Pile and concrete to 25%.
	Pile 2	Pile and concrete to 25%.
	Pile 3	Pile and concrete to zero (picture 16).
	Pile 4	Pile and concrete to 25%.
	Pile 5	Pile and concrete to zero.
Bent 9	Pile 1	Pile to zero, concrete to 50%.
	Pile 2	Pile to zero, concrete to 50%.
	Pile 3	Pile to zero, concrete to 50%.
	Pile 4	Pile to zero, concrete to 50%.
Bent 10	Pile 3	Pile to zero, concrete to 25%.
	Pile 4	Pile to zero, concrete to 25%.
	Pile 5	Pile to zero, concrete to 25%.
Bent 11	Pile 1	Pile to zero, concrete to 25%.
	Pile 2	Pile to zero, concrete to 25%.
	Pile 3	Pile to zero, concrete to 25%.
	Pile 4	Pile to zero, concrete full section.
	Pile 5	Pile to zero, concrete full section.
Bent 12	Pile 1	Pile to zero, concrete full section.
	Pile 2	Pile to zero, concrete full section.
	Pile 3	Pile to zero, concrete full section.
	Pile 4	Pile to zero, concrete full section.

The reinforced concrete beams and deck have minor cracks and spalled areas in places (picture 17), otherwise in very good condition (picture 18).

CELLS

The cells are constructed of flat sheets filed with gravel and capped with concrete. The sheets appear to have been ⅜" thick when new. They have a concrete encasement on the exterior from elevation 2.0 MLW presumably down to the mud line. The north and south cells are circular and about 40' in diameter. The middle cell is constructed of six 40' diameter cells on 35' centers such that they overlap to form one long structure. The north and south cells are accessed from the middle cell by approximately 60' long walkways made from two wide-flange sections with cross-frames, lateral bracing, and a wood deck. There was a fender system on the west face of all three cells which is now missing or destroyed.

South Cell (picture 19)

The top 7' of the sheet piles above the high tide line is corroded very heavy (picture 20), has frequent holes (picture 21), and in other places can be holed with a hammer. Below the high tide line, the sheets appear full section with no corrosion. There are weep holes about 12' below the cap that are enlarged from corrosion but ok. The concrete encasement beginning at elevation 2.0 MLW appears intact (picture 22).

The concrete cap is spalled on the bottom of the southwest face all over about 2" deep. It is spalled on the bottom of the west face about 8' long by 2' wide by 4" deep with rebar showing all over (picture 23).

South Bridge

The girder webs are corroded 1/16" and the bottom flanges are corroded ⅛" at both ends. This section loss is insignificant. The concrete seat on the middle cell has spalled heavily and the northwest girder bearing is undermined with only 25% bearing (picture 24).

Middle Cell (picture 25)

The top 7' of the sheet piles above the high tide line is corroded very heavy (picture 26), and has frequent holes (picture 27), and in other places can be holed with a hammer (picture 28). Below the high tide line, the sheets appear full section with no corrosion (picture 29) but there are a few places of heavy corrosion or holes above the low tide line (picture 30). There are weep holes about 12' below the cap that are enlarged from corrosion but ok. The concrete encasement beginning at elevation 2.0 MLW appears intact.

The concrete cap has a few spalled areas on the bottom and on the bottom corners but is otherwise in good condition.

North Bridge

The girder webs are corroded 1/16" and the bottom flanges are corroded ⅛" at both ends. This section loss is insignificant. The concrete seat on the middle cell has spalled heavily and the southeast girder bearing is undermined with only 50% bearing (picture 31).

North Cell (picture 32)

The top 7' of the sheet piles above the high tide line is corroded very heavy, and has a few holes. Because of the falling tide, no hammer inspection was made at the middle cell above the high tide line. Below the high tide line, the sheets appear full section with no corrosion. There are weep holes about 12' below the cap that are enlarged from corrosion but ok. The concrete encasement beginning at elevation 2.0 MLW appears intact.

CONCLUSIONS AND RECOMMENDATIONS

Immediate Action

The sheet piles and pipe piles exhibit the typical heavy corrosion that occurs in the splash zone above the high tide line. This corrosion is worse in the sheet piles because the fill has settled allowing moisture and air to attack from both sides. The upper part of the pipe piles is corroded on the outside only because the inside is protected with the concrete fill. The pipe piles are astonishingly poor below the low tide line with half of them to zero effective remaining cross-section or nearly so.

The condition of the pipe piles requires that the pier be closed to all uses including foot traffic. The pier is presently fenced to prevent access. The fence must be improved so that it cannot be climbed around to access the pier as is now possible. The fence must be inspected periodically and maintained as necessary.

Potential Repair Plans

There are two potential courses of action. The first would be to stabilize the pier and preserve it for public access. The second would be to reconstruct the pier to permit berthing large vessels.

Stabilizing the pier for public access requires improvements to the pile supported pier and sheet pile cells. The pile supported portion can be salvaged by coring holes in the concrete deck, driving new pipe piles, and pouring new cast-in-place concrete caps adjacent to the existing caps. The estimated construction cost for this is $65,000 per bent. The construction cost for all thirteen bents would be $845,000. Also considered was demolition and replacement with a timber pier. Although a new timber pier could be built for about $500,000, demolition and disposal of the existing concrete deck and

pipe piles would be more expensive. Also considered was repairing the piles by splicing in new material and encasing them with a concrete jacket. This repair is nearly all underwater work and its cost would be comparable to the cost for new pipe piles, but with less quantifiable results compared to new piles with reliable capacity. The same repair of the pipe pile supported pier is required whether the entire pier is used for public access or for large vessels. At the present rate of deterioration, the pipe pile supported pier has an unquantifiable life span before it fails from its dead weight. Consideration should be given to repairing the pier as a lessor cost than potential removal cost should it fail.

The sheet pile cells are very heavily deteriorated in the splash zone above the high tide line. The sheets are already thin and holed in this area. They have an unquantifiable life span before failing from their dead weight. Stabilizing the middle cell for public use may be possible by driving new pipe piles in the intersections of the overlapping circular cells and pouring a new concrete pile cap under the existing concrete cap. If necessary, it may be feasible to core holes in interior of the concrete deck and install helical piles if the fill inside is not rock. It may be feasible to plug holes in the sheets and grout voids under the concrete caps. The estimated construction cost for installing 14 perimeter piles and incorporating them into the existing concrete cap is $450,000. The cost for helical piles and grouting will vary greatly with the amount required but would likely be approximately $400,000. It is assumed that for public access purposes the north and south cells would be abandoned in place and the connecting bridges removed.

The sheet pile cells are not capable of supporting the lateral loads associated with berthing large vessels. They would need to be reconstructed by removing the concrete caps, driving new sheet piles around them, filling the void between the sheets with concrete, installing a new concrete cap, and a new fender system. The estimated cost to rebuild the cells is $6,000,000.

The estimates above are "ballpark" estimates intended to convey an order of magnitude of probable repair cost. Detailed estimates or detailed analysis of repair alternatives are beyond the scope of this report. No calculations or estimates of pier capacity were done for this report.

The small boat berths at the head of the dock have not received a lot of attention in this report. The sheeting is in fair condition and given the minimal size of these finger piers, and the minimal loading, no short or long term repairs are recommended. If and when they become unsafe they can be repaired or removed relatively easily. Railings should be installed on these finger piers if they are to be open to the public but not in marine use.

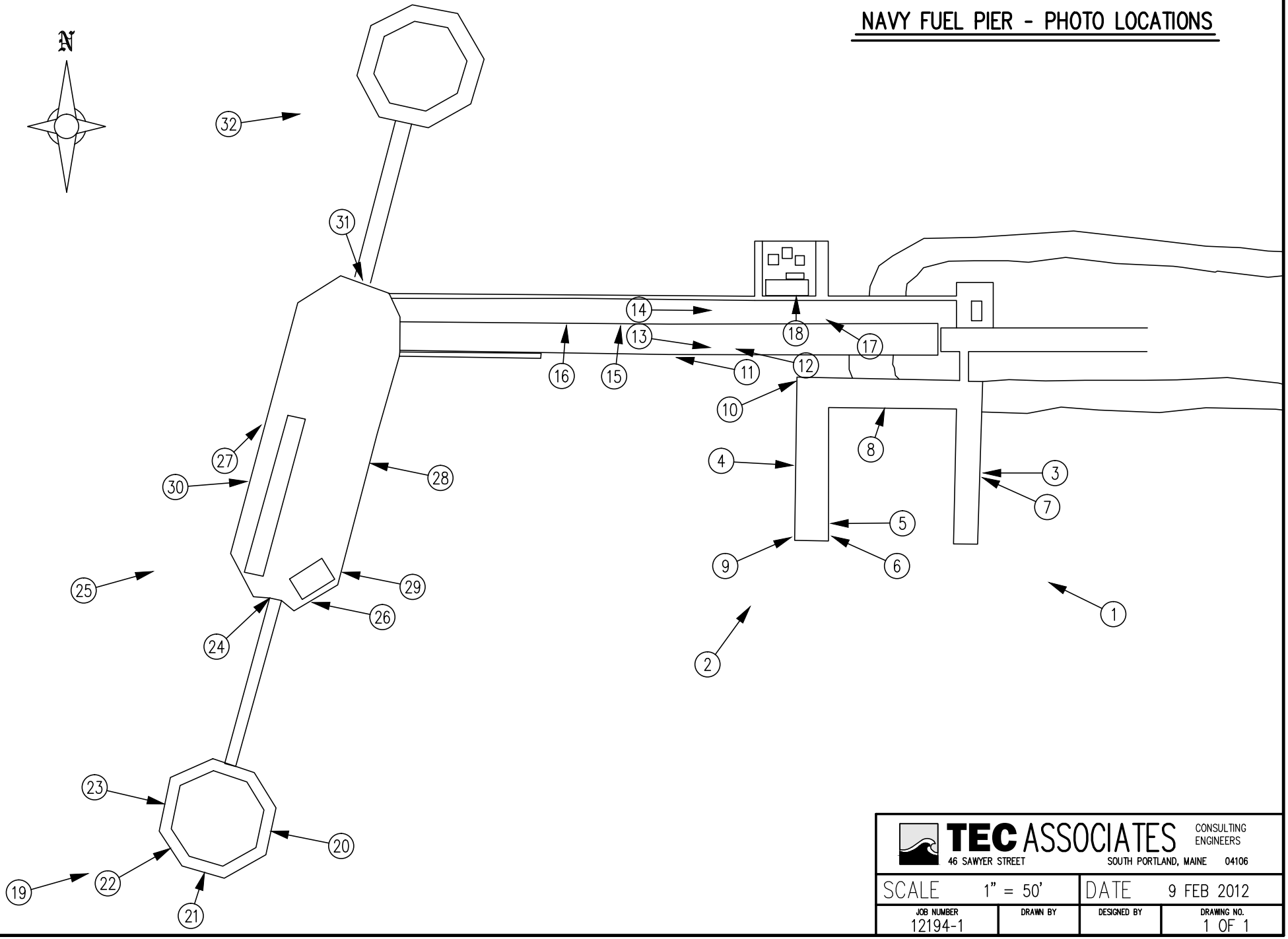
Additional Inspection

This inspection was done in one day beginning at high tide and finishing at low tide. Ordinarily a full inspection of sheet pile requires a mapped plan for taking thickness readings with an instrument. Here I believe that enough information has been gathered to make an informed decision about the pier and the extent of additional inspection necessary. If more information is desired, I would recommend a one-day cursory diving inspection to learn the extent of corrosion at the pipe piles and the extent and condition of the concrete encasement that appears around the cells. The estimated cost of a one-day cursory diving inspection and report is $5,000.

I would recommend one additional day in a small boat inspecting the sheeting above the high tide line. Because of the falling tide, I had little opportunity to hammer some upper parts of the middle cell or any of the north cell although such an inspection would likely confirm what is already suspected. As the tide drops, thickness readings could be taken on the sheets in the tidal range where they appear relatively good in most locations. The estimated cost of this inspection and a supplemental report is $2,500.

Given what is already learned and what is likely to be learned by any additional inspection detailed above, further in-depth study of the pier is likely not necessary.

NAVY FUEL PIER - PHOTO LOCATIONS



TEC ASSOCIATES CONSULTING ENGINEERS 46 SAWYER STREET SOUTH PORTLAND, MAINE 04106			
SCALE 1" = 50'		DATE 9 FEB 2012	
JOB NUMBER 12194-1	DRAWN BY	DESIGNED BY	DRAWING NO. 1 OF 1

Harpswell Navy Pier
Photos by: Wayne Duffett Date: 19 January 2012

Picture 1 - Finger piers looking west.

Picture 2 - Finger piers looking northeast.

Harpswell Navy Pier
Photos by: Wayne Duffett Date: 19 January 2012

Picture 3 - East finger pier, corrosion above high tide line.

Picture 4 - West finger pier, corrosion to outer web.

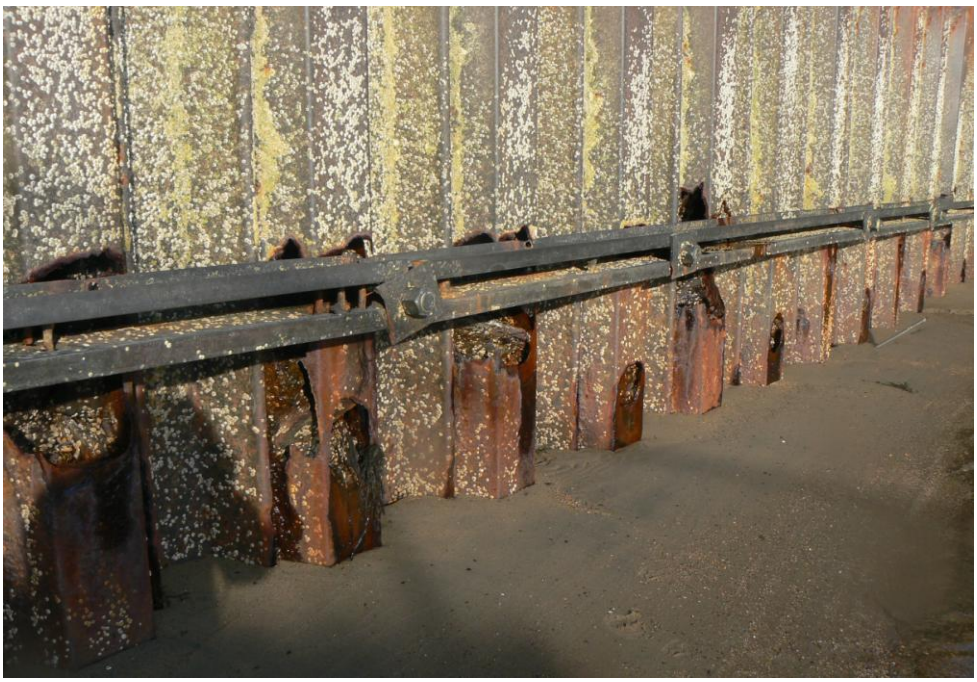
Harpswell Navy Pier
Photos by: Wayne Duffett Date: 19 January 2012

Picture 5 - West finger pier, corrosion to corner of sheet.

Picture 6 - West finger pier, hole made with hammer.

Harpswell Navy Pier
Photos by: Wayne Duffett Date: 19 January 2012

Picture 7 - Corrosion at weep hole. Sheet thickness reduced 50%.



Picture 8 - North bulkhead, corrosion behind wale.

Harpswell Navy Pier
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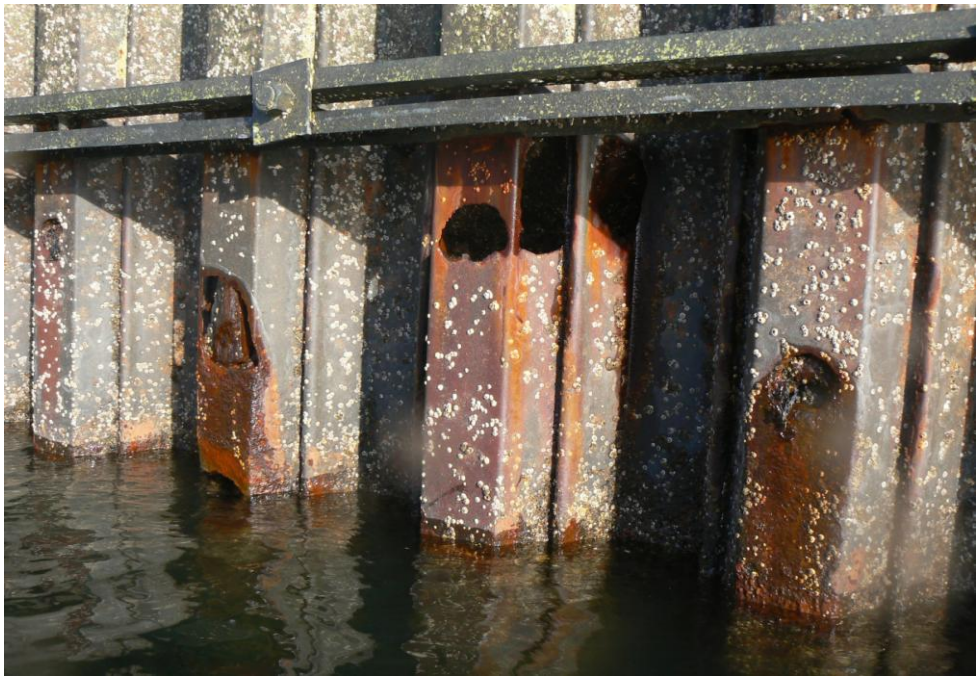
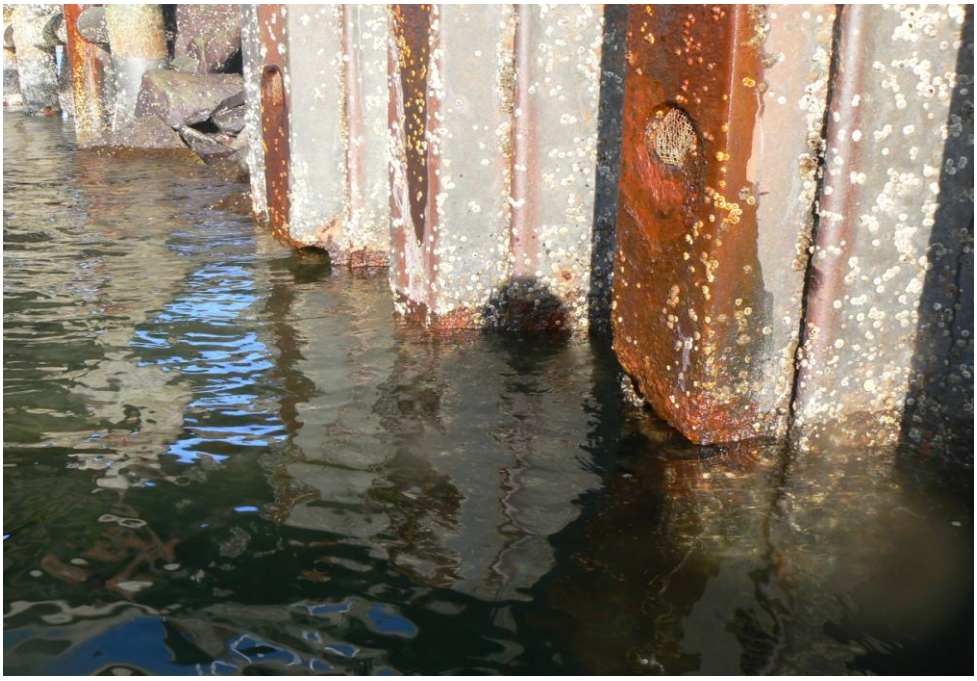


Picture 9 - Corrosion to wale, and webs at wale and low tide line.



Picture 10 - West finger pier, corrosion to webs at low tide line.

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Picture 11 - Pipe piles looking west.

Picture 12 - Typical corrosion loss 3/16" +/- in the splash zone.

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Picture 13 - Bent 5, pile 2, freeze damage.

Picture 14 - Bent 5, pile 4, pile and concrete fill to zero.

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Picture 15 - Bent 6a, pile 3, pile and concrete fill to zero.

Picture 16 - Bent 8, pile 3, pile and concrete fill to zero.

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Picture 17 - Span 2, minor spalling at bottom of beam.

Picture 18 - Span 3, typical good condition of deck.

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Picture 19 - South cell looking north.

Picture 20 - South cell, typical heavy corrosion in splash zone.

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Picture 21 - South cell, holes in splash zone.

Picture 22 - South cell, concrete encasement at low tide line.

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Picture 23 - South cell, spalling on west face.

Picture 24 - South bridge, steel corrosion and loss of bearing area.

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Picture 25 - Middle cell looking northeast.

Picture 26 - Middle cell, typical heavy corrosion in splash zone.

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Picture 27 - Middle cell west face, area of heavy corrosion.

Picture 28 - Middle cell east face, hole made with hammer.

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Picture 29 - Middle cell, typical good steel in tidal range.

Picture 30 - Middle cell west face, very poor area at low tide line.

Harpswell Navy Pier
Photos by: Wayne Duffett Date: 19 January 2012

Picture 31 - North bridge, steel corrosion and loss of bearing area.

Picture 32 - North cell looking north.